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RETROSPECT

OF

PRACTICAL MEDICINE AND SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M. D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.,

AND

JAMES BRAITHWAITE, M. D., LOND.

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☞ The Publisher of the American Edition of Braithwaite regrets to state that he has finally renounced his long anticipated design of adding a digest of American Journals to the English Edition. The continued high prices of material and labor, together with the little response which the proprietor has met with among the profession and the trade, have dissuaded him from commencing this undertaking.

The new addition to the reprint—a list of the publications of the previous six months—will be permanently retained.

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PRACTICAL MEDICINE,

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DISEASES AFFECTING THE SYSTEM GENERALLY.

1.—ON THE USE OF THE THERMOMETER IN FEVER.

By Dr. John Southey Warter.

[The actual temperature of the body cannot be estimated by the hand, the skin sometimes feeling hot when the temperature is normal, and sometimes feeling cold when the temperature is considerably above the average. In typhoid fever the hand of the patient is frequently cold, whilst the temperature of the body is too high as marked by the thermometer in the axilla. In many diseases the pulse and temperature rise and fall together, so that from the observation of one we may often infer the other correctly; this, however, is not always the case, as in typhoid fever, for instance, the pulse ranges low at first while the temperature is high. In some cases of weakness or nervousness the pulse may be very frequent whilst the temperature is normal. In many cases recovering from acute disease the temperature will fall down for a time below the standard of health, and then again mount up slowly to the normal.]

As far as I have noticed in typhoid fever, as a general rule, the temperature of the body rises high in the first week, while the pulse remains comparatively low, and this is not the case in typhus or in many of those other diseases for which this fever is apt to be mistaken in its early stage. Thus, in typhoid fever I have only one or two records of a pulse up to the eighth day higher than 120, and this number is uncommon, most of them ranging from 90 to 110 beats per minute; in all these cases, however, the temperature was as high as from 102°·4 to 104°·3 Fahrenheit. Exceptional cases to this rule occur, as might have been expected, in young children, on account of the normal rapidity at which the pulse beats at this age.

In typhus fever running its usual course there seems a direct ratio between the rapidity of the circulation and the heat of the body; the pulse and temperature rising together till the fever reaches its climax, when the pulse ranges generally from 110 to 144, and the temperature from 103° to 104°·5. At one time I used to think that a low pulse and high temperature at the commencement of fever always indicated that it was specifically typhoid, but more extended observation has taught me that there are many exceptions to this rule; thus occasionally in febricula, acute rheumatism, tonsillitis, exhaustion from suckling, and phthisis pulmonalis, a temperature of 102° or 103° may occur with a low pulse rate; and these exceptions are the more worthy of our attention as the aspect is in them often typically that of the early stage of typhoid fever; thus in all there may be a clear, white, and perspiring skin, red lips, tinted cheeks, and dilated pupils, and hence without some closer investigation a superficial observer may be often easily deceived in his diagnosis. Perhaps the cases of enteric fever in which the diagnostic use of the thermometer is most striking, are those in which malaise and perhaps some diarrhœa have existed for several days and yet the patient has got about; one day at length, however, the doctor is consulted, and finding the tongue clean and the pulse quiet, he is thrown off his guard, and is about to

think but little of the attack; wishing to make sure, however, ere he dismisses his patient, he places his thermometer in the axilla, and the mercury rising to 102° or 104° shows him that it is typhoid fever, and not a simple diarrhœa that he has to deal with. Again, in how many cases of supposed typhus does the thermometer, by marking a low temperature, contradict every other symptom! There may be a history of exposure to infection, a rigor may have occurred, the face may be muddy, the eyes injected, the pupils small, the pulse rapid, and the tongue thickly furred; still, if with all this the temperature at mid-day is below 99°·5 or 100°, typhus fever, at any rate, may be stated positively not to exist. Of course in saying this I do not mean to include those cases in which the rash is out and the patient is collapsed, or those cases in which the fever is really past but the black tongue and rapid pulse of exhaustion exist; these tell their own tale and require no such instrument as the thermometer to aid in their diagnosis.

In a fair proportion of cases the acme of typhus is reached on the eighth day, and it may occur, as a rare exception, as late as the tenth, twelfth, or possibly the thirteenth. There seems a decided tendency in many cases of typhus for a rise of temperature to take place on alternate days, and especially on the odd ones; of these a rise on the thirteenth day is most common, and after this a rise on the eleventh. The fever of typhus ends usually by lysis (gradually) about the fifteenth, sixteenth, or seventeenth day, but it may end suddenly in any case by crisis a day or so after the highest temperature has been reached.

In typhoid the highest afternoon temperatures occur probably as early as about the fourth day. There is a tendency to rise on alternate days, especially on the thirteenth, and the ninth, eleventh, and fifteenth; but it runs a course longer than typhus, ending generally some time from the twentieth to the thirtieth day. High temperatures may be occasionally reached at any time during its course, and its decline is gradual, and, as far as my experience goes, seldom ends by crisis.

As regards prognosis in typhus and typhoid fever, the most important rules which can be derived from the records of a single daily temperature seem to me to be two; namely, that a sudden rise of temperature in either indicates some intercurrent disease, as congestion of the lungs, and that a sudden fall of the thermometer in typhoid fever indicates either diarrhœa or hemorrhage.

In treating fevers, at any rate towards their terminations, I think we may derive some hints from the use of the thermometer, for by its marking a normal temperature when perhaps the pulse is frequent, the patient constantly delirious, and the whole mouth black with sordes, it shows us plainly that these symptoms are not the result of cerebral inflammation, but depend in all probability on exhaustion; hence nutrients and stimuli appear the rational curative agents, versus leeches, cupping, and other lowering remedies. Counter-irritation behind the neck may, however, be employed with advantage in these cases; the rationale of its action is not very apparent, but I suspect that in some way by reflex action it increases the tone of the cerebral arteries, and that thus again a healthy balance is restored between these vessels and the tissue which they supply.

The study of thermometry in typhus and typhoid fever, puts, I think, an end to the question as to whether these two depend on separate poisons, or are really one and the same disease. In typhus the pulse and temperature rise more or less together until the seventh, eighth, or ninth day, when they are at their highest, then they begin to decline, and drop down steadily day by day in unison, both becoming normal about the fifteenth or sixteenth day. In typhoid fever, however, all is chaos; the pulse and temperature rise and fall irregularly, taking separate and distinct courses. Both, however, remain, on the whole, moderately high from about the sixth to the fifteenth day, then a fall takes place pretty rapidly, and between this and the twentieth day the normal mid-day temperature is again reached in most cases.

The range of temperature in measles is a short and rapid one, thus contrasting well with that of typhus fever for which this disease is apt to be

mistaken. As far as I have observed, it rises to its highest point about the fourth, fifth, or sixth day, and then again, sinking rapidly, it falls to the temperature of health about the seventh or eighth. Thus, after the sixth day, at any rate, its course is diametrically opposite to that of typhus; for while in measles after that date both the pulse and temperature are falling rapidly, in typhus fever they are both rising, and on the seventh or eighth day, when the temperature of a case of measles is normal, the temperature of typhus is at its greatest height, ranging from 103° to 105° Fahrenheit. The highest temperature reached in measles is not very great, being rarely higher than 103°; the disease ends usually by rapid lysis, the pulse and temperature falling together. In the curve which is given to represent measles, it is shown how, after reaching its acme of temperature comparatively early, the thermometric wave takes a rapid downward course being thus entirely distinct from the one representing typhus fever. It may be well to give a caution here as to the fallacy of intercurrent lung disease setting in, for pneumonic congestion of the lung occurring about the fourth or fifth day in measles will keep up the patient's temperature, and make the thermometrical range, taken alone, simulate typhus. As, however, in such cases the lungs would naturally be auscultated, this fallacy is not likely to interfere with actual practice.

In scarlet fever, as a rule, the temperature rises to its greatest height from the second to the fifth day, the pulse also being highest at this early date and by its extreme rapidity often aiding in diagnosis; from this point the temperature declines gradually, attaining to the normal about the tenth day. From the study of those cases which I have taken, I imagine that the temperature of a fairly severe case on the second or third day would usually range as high as 104; in mild cases, however, the temperature need not be elevated to any great extent, and I have taken one on the third day as low as 99 Fahrenheit.—*St. Bartholomew's Hospital Reports, Vol. II*, 1866, *p.* 64.

2.—ON THE PRACTICAL VALUE OF ACCURATE DAILY OBSERVATIONS OF THE TEMPERATURE OF THE BODY IN ACUTE DISEASE.

By Dr. Thomas Armetireding Compton, B. A., Dublin.

[Dr. Compton's object in takingup the study of temperature has been mainly with a view to test their practical value for general use in ordinary practice, and consequently his observations have (with some few exceptions) been taken only once daily, but always as near to the same hour as possible (generally about 2 P. M.) The observations have been without exception made in the axilla. The total number of cases in which the temperature and general symptoms have been watched and recorded daily throughout their course amount to 200, of which sixty were typhus, thirty typhoid, twenty pneumonia, fifteen scarlet fever, and the remaining seventy-five comprise cases of febricula, acute rheumatism, erysipelas, chorea, acute tuberculosis, &c. The total number of observations made in these cases amounts to 5,000. Dr. Compton considers that a temperature of 98·4 Fah. is too high an average temperature. He considers the healthy range to be somewhere between 95·5 and 98·5 Fah., the most common temperature met with, being probably 97.4 Fah. He says:]

The following are the propositions I wish to establish:—

1st. That a continued daily temperature of 99° Fah., and upwards, indicates an unhealthy condition, and occurs in every case of acute disease. As I have never met with one case in which such a temperature was present, under normal conditions, in a healthy adult, and as every case of the 200 taken exhibits this state of temperature, the proposition may be considered to be proved.

2nd. That any one observation of a very high temperature (such as 105° Fah.), in any case in which the general symptoms do not appear of any particular severity, should lead to a very attentive re-examination, and suggest

a very careful watching, especially if occurring in a non-diagnosed case; such a temperature being present only in severe forms of any disease.

In support of this I will mention the following case:

W. B., aged 29, a well nourished man, of rather sallow complexion, somewhat excited manner, having an occasional spasmodic way of speaking, complained, on admission, of sore throat, and on examination, both tonsils and the back of the pharynx were seen to be considerably inflamed. He gave an imperfect history of having been ill about a week. This, at first sight, seemed to be merely a somewhat severe case of tonsillitis, and no further very minute examination, by the physician in charge, appeared to be immediately necessary. The case was therefore left for the history, &c., to be made out by the clinical clerk, before the visit next day, as is usual in such cases. Finding, however, the man's temperature to be 105·4 Fah., I was interested in the case; and I made out, on further examination, the existence of partial trismus, and that the tongue, when protruded, deviated slightly towards the right side. Having mentioned this state of things to the physician, he returned again on purpose to see the case, when he found the symptoms still more severe, and considered the prognosis very unfavourable.

This man, moreover, died on the next day, some twelve hours after admission, the case being one of septicemia.

Another equally important case of cerebro-spinal meningitis, in a girl of 18, was thought by many who saw it on admission, to be one of hysteria; but here a temperature of 103·5 Fah., was quite sufficient to negative such an idea.

This case also terminated fatally.

3rd. That the thermometer is of great use, as a means of diagnosis in those cases, which frequently present themselves, of general *malaise*, often accompanied by a history of rigors, loss of sleep, &c.; such symptoms being due either to the commencement of one of the specific fevers, or merely to some gastric or uterine disturbance of a temporary character.

In these cases it is often at first impossible to decide, judging only from the pulse and general symptoms; but if the state of the patient be due to the more serious cause, we shall invariably find an abnormal temperature; and on the other hand if due to any other, a normal temperature will be often met with, frequently accompanied by a very rapid pulse. I have never met with one case in which, the temperature being normal, specific fever afterwards developed itself, and although I have nearly twenty examples of this proposition, I will only bring forward one.

E. J., aged 24, a nurse in a ward in which there were several cases of typhus and typhoid fevers, is a well nourished and generally healthy woman. The cheeks are flushed, conjunctiva slightly suffused, tongue covered with thin fur, and inclined to dry; bowels have been loose the last three days, and were open five times yesterday. She complains of frontal headache, pains in all her limbs, want of sleep, loss of appetite, &c. Has not felt quite well for about a week, but continued at her work until yesterday. She "felt very cold all over" three days ago, and sat over the fire, but could not get warm. Her pulse is 72, temperature 97° Fah. The next day, and the day after, she exhibited much the same symptoms; her pulse, however, going up to 120 and 100 on the two days respectively, whilst the temperature remained steady between 96° and 97° Fah. Two days afterwards she was quite convalescent, and about the ward again. This case bore as strong a resemblance to that of an early stage of typhoid fever as it was possible to do, and for the first few days many considered it to be one of this disease.

A point of great interest in connection with this case was the fact that some three months afterwards the patient had well marked typhus, with a temperature of 103° Fah., and a pulse of 120 on the fifth day, which was the first time I had an opportunity of seeing her on this occasion.

4th. That the temperature in every disease has a tendency to run a peculiar course, and has a certain range of altitude, a knowledge of which course and range is of great value as an assistance to us in prognosis.

In connection with this proposition I should observe that I have not found

the temperature in acute disease to be perceptibly affected by the season of the year at which the disease may have occurred, although the temperature of the wards during the year has varied to a considerable extent.

Again, if cases of similar severity at different ages be compared, the altitude attained by the temperature in any disease does not appear to be influenced by the age of the patient, although normally is generally reached somewhat earlier in children than adults.

I have drawn up some charts to show the course of temperature as observed by myself in typhus, typhoid, and scarlet fevers, pneumonia, acute rheumatism, erysipelas, and tonsillitis.

These diagrams are not founded on any average, but merely represent actual typical cases. I have preferred to adopt this plan on account of the fallacies likely to exist in such tables if drawn up from averages. Errors in establishing the exact day of the disease are, in many cases, unavoidable; but these, although only to the extent of a single day, might considerably affect the ultimate result in any general average.

Having discussed typhus and typhoid at some length in another paper I shall not further allude to them. To the other diseases (the course of temperature in which I have endeavoured to illustrate by diagrams) I will briefly refer.

In pneumonia we have high temperatures as early as the second day, with the maximum generally on the third or fourth, and a sudden fall (of perhaps 5° Fah.) to normal on the seventh or eighth.

In acute rheumatism we have a long-continued slightly abnormal temperature, generally ranging between 99° and 102° Fah., and very rarely reaching 103° Fah.

Erysipelas is characterized by very sudden changes of temperature: thus, we often get an alteration of 4° or 5° Fah. in twenty-four hours, and occasionally a fall of 7° or 8° Fah. in the same period. I have observed in several cases that a considerable fall has taken place immediately on the appearance of the characteristic redness.

The temperature of tonsillitis is especially interesting when compared with that of scarlet fever; and as the diagnosis in the early stage between the two is often doubtful, we may frequently be much assisted by the observation of the temperature.

In tonsillitis the temperature in the middle of the day, when at its maximum, which is generally attained about the fourth day, rarely exceeds 100°·5 Fah.; and this occurs with a pulse often below 100. Normal is reached about the sixth or seventh days.

In scarlet fever, on the other hand, the maximum is arrived at about the third day, when the temperature is generally 104° Fah., whilst the pulse is considerably above 100. The normal is not usually attained until the tenth or twelfth days.

Although I have taken a few cases of many other diseases besides those just mentioned, yet I have preferred at the present time, to confine myself to the examination of the course of temperature in these seven only, considering that my experience of this subject in any other disease has not at present been sufficient for me to judge fairly of it. I would, however, just allude to the possibility of temperature being of great assistance to us as a means of diagnosis between typhus fever with severe cerebral disturbance (when occurring without any rash), and purely cerebral cases of meningitis or cerebritis. I have only had an opportunity of taking the temperature of two purely cerebral cases, but in both of these the temperature rarely exceeded 101° Fah., whereas with similiar symptoms due to typhus fever, we might have expected the thermometer to stand some 3° higher.

I should also state that the highest temperature I have ever taken was 107°·2 Fah., and occurred in a case of pneumonia following tracheotomy; the next highest was 106°·2 Fah., in erysipelas; generally, however, temperatures above 105° Fah. have been rarely met with.

I will conclude this part of the subject by bringing forward a case to prove

the value of a knowledge of the course and range of temperature in different diseases.

A boy of fifteen was admitted with general *malaise* and sore throat. His tonsils and the back of his pharynx were somewhat inflamed, but his tongue was moist and nearly clean.

After the first few days he complained of nothing except weakness, although his voice continued very husky. His appetite remained pretty good throughout, and he slept well. About the fifteenth day he had some bronchitis, and on the sixteenth some hemorrhage, with a loose motion; previously his bowels had been somewhat confined. The hemorrhage did not recur. There was never any rash or abdominal tenderness, and the physician in charge of the ward considered the patient's illness to be due to the apparent symptoms manifested, viz., the sore throat, with probably some laryngeal mischief, and the thoracic complication.

The course of temperature was that of typhoid fever throughout; and at the time I mentioned this fact to several, but little expected to be afforded any corroboration of my statement, as the lad's temperature fell to normal on the twenty-eighth day; and two days after this he was up and about the ward.

However, as the case was not considered to have been one of typhoid fever, there was no especial necessity to be careful with his diet, and he was placed on meat diet. Having a very hearty appetite he did good justice to the food allowed him, besides partaking of some extras which were surreptitiously conveyed to him by his friends. The consequence was, to use his own expression, he went to bed "feeling very well," but "very full." Some hours afterwards symptoms of colic came on, which not being relieved by the appropriate measures adopted, were followed by those of peritonitis, of which the lad died on the seventh day from his seizure.

The *post mortem* disclosed a quantity of purulent fluid in the peritoneum, and numerous ulcers of Peyer's glands, the majority of which had already cicatrized but in many the healing process was still going on. The peritonitis had been caused by an overloaded intestine, previously weakened, the colon being completely stuffed with scybala. There was no perforation.

5th. From the last proposition it follows, that the same altitude of the thermometer attained at one period of any disease is not of the same importance as the same height reached at another time in the same disease.

Thus, in typhoid fever, a temperature which has been rising for two or three days, reaches perhaps 104 Fah. between the seventh and fourteenth days, without causing any anxiety; whereas, should the same phenomenon occur about the twenty-eighth day, a fatal termination may probably be expected.

And again, the actual altitude attained on a certain day in one disease is not of the same importance to our prognosis as the same height reached on the same day in another disease. Thus, a temperature of 104° Fah. in erysipelas is very common during the first week, and need not give rise to any alarm; but should such occur at the same date in acute rheumatism I should consider it of much more importance.

6th. That although, in all diseases, a high range of temperature generally indicates a severe case, with a slow convalescence, and a low range usually occurs in a mild case, and is followed by a rapid convalescence; yet there is no actual temperature in any disease which necessarily fortells a fatal termination. Thus, I have registered 105°·6 Fah. in a severe case of typhus ending favourably, 106°·3 Fah. in erysipelas, 105°·3 in typhoid; and each of these temperatures was the highest I ever took in the respective diseases.

I certainly once registered a temperature of 107°·2 Fah., in a fatal case of pneumonia; but the great majority of fatal cases generally, although always exhibiting abnormal temperatures prior to collapse, have by no means had any extraordinarily high ranges. I believe that an abnormal course of temperature is more often the precursor of a fatal termination than any universally high range.

7th. That in the majority of cases a rise of temperature is contemporary

with a rise of pulse, although such is often not a proportional one, and may not take place at all unless the alteration in temperature be as much as 1½° or 2° Fah.

Cases of typhus are, perhaps, the best examples of the simultaneous alteration of pulse and temperature.

8th. That where the temperature and pulse together do not coincide with the general symptoms, the two former may be generally relied on as to the actual state.

Thus, in typhus, towards its close, we often get a continuous fall of temperature and pulse for perhaps three or four days before there is any improvement in the general symptoms; and in these cases the two former always foretell rightly.

There is, however, a well marked exception to this rule in the later stages of typhoid fever, as mentioned in another paper.

9th. That where the temperature and general symptoms agree together, but do not coincide with the state of the pulse, the two former may generally be relied on as to the actual state.

Thus, in cases of hysteria, and in cases of excitable persons approaching convalescence after fever, we often suddenly get a very high pulse, which is sometimes continuous for days, although the temperature and general symptoms are neither of them adverse.

10th. That in those cases in which the pulse and general symptoms remain the same, a moderate fall of temperature on one occasion is not to be relied on; but should such a fall continue in a moderate and gradual manner, for some days, and at such a period when a fall was to be expected, the temperature may then be depended upon. Severe cases of typhus, towards their close, often give examples of this sort.

In those cases, however, in which the pulse continues frequent, and the general symptoms are severe and without improvement, a considerable fall of temperature (say 5° or 6° Fah.) is to be regarded with anxiety, being probably due to some internal hemorrhage, or to the commencement of a state of collapse.

Thus, in a case of icterus, in a girl of 15, due to obstruction of the common duct by a hydatid cyst, and accompanied by peritonitis, on the three days preceding death, the pulse had stood at 140, 140, and 136, respectively, the temperature having been on the same days 104°·2, 104°·5 and 99° Fah.; whilst the general symptoms continued without alteration. Here, on the last day, we got a sudden fall of 5½° Fah., which was the first sign of collapse terminating in death some twenty-four hours afterwards.

Again, in a case of typhoid fever, on the seventeenth day there was a sudden fall of 4° Fah. from the preceding day in consequence of considerable internal hemorrhage.

11th. That in those cases in which the pulse and general symptoms continue the same, being the one frequent and the other severe, a continuous rise of temperature for some days, occurring at a period of disease at which some improvement might generally be expected, is usually the precursor of a fatal termination.

Thus, in a case of typhoid fever, terminating fatally on the thirty-sixth day, the pulse and general symptoms continued without change until the thirty-fifth day; the former having stood at 92 on the twenty-ninth day, remained steady and rather below that frequency until the thirty-fifth day, when it suddenly rose to 124. The temperature, however, rose continuously from the twenty-ninth day nearly a degree a day, until it stood 5° higher on the thirty-fifth than on the twenty-ninth day—the height registered on the thirty-fifth day being 104° Fah.

12th. That although it is possible that the state of the temperature alone in acute disease may, perhaps, hereafter prove to be the one safest symptom to rely upon if taken by itself (and I believe it is at present, at least equal to the state of the pulse, and of greater value than this certainly, if only its frequency be taken into account), yet the temperature must be considered merely as an aid, and all other symptoms must be carefully examined into,

as it is on comparison with these that its greatest value is always to be found.

The preceding propositions, which are not intended to be put forward as dogmatic rules, being merely the result of a very limited experience, and being probably only approximations to the real truth, which is always deep down "at the bottom of a well," imperfect though they be, nevertheless contain, I think, amply sufficient to prove the great value of the daily observation of the temperature in acute disease.

I will now refer to those who disregard the value of the clinical thermometer, and amongst these are many of high authority, whose opinion is entitled to great consideration.

What, then, is the reason of the disregard of such? 1st. Some do so because they allege that they can sufficiently distinguish by their hands normal and abnormal states of temperature, and can carry such sensations in their minds, or commit them to paper under such expressions as "cool," "moderately cool," "warm," "hot," "very hot," "pungently hot," &c.

The fallacy of these expressions can, however, be easily ascertained by any one who will take the trouble, in a few acute cases, first to write down his sensations, and then take the temperature by a thermometer.

Heat and cold are only temperature sensations, and as our hands vary considerably in their temperature, it follows that a body submitted to a hand, the temperature of which is 95°, will refer to the mind a very different sensation to that which it would do were the temperature of the hand 10° or 20° lower.

As an example of this fallacy, I will only mention the following fact:—

I have heard a physician of high standing observe that the skin of a patient was "moderately cool," when the actual temperature in the axilla was 104° Fah. This is by no means an uncommon occurrence. 2nd. There are some authorities who state that an abnormal temperature generally does not occur at all in cases of acute fever, and on this account undervalue the thermometer.

I can, however, honestly state that I have never met with one such case, neither have I found any one who has used a thermometer who has done so, except the patient were in a state of collapse just prior to death.

Consequently, with all due deference to such authorities and their statements, I am strongly inclined to think that the actual existence of such cases is more than doubtful; and if the temperature of a patient which is really 104° Fah. can be called "moderately cool," it will not be difficult to understand how such cases have been supposed to occur.

3rd. There are others, again, who disregard the value of the thermometer because they think they have tried it and found it wanting.

These have tried it certainly, according to their own manner, but generally with utterly wrong and probably self-conceived ideas as to its use. They have started on their trial with the belief that the abstract degree of heat was all that they had to consider. Such as these, consequently, soon find out that a thermometer will lead them into all sorts of blunders, and properly discard it. But would these be merely content with considering the height of frequency to which the pulse had attained, without taking into account its volume, regularity, its condition yesterday, the disease, and the individual in whom it occurred?

Well, then, some very similar conditions must also be considered before placing an actual value on any one observation of temperature—thus, the disease, its period, its height yesterday, &c.; and without reflection on these points, any observation will be useless indeed.

It would, no doubt, save a great deal of trouble if we could decide our prognosis and diagnosis by means of the temperature alone, and also without any practice or experience in the use of the clinical thermometer; but would any one discard the stethoscope merely because some experience in its use was required before any one could be in a position to place a value on the sounds he might hear, or because, even after considerable practice, the value of some sounds (such as certain cardiac murmurs) still remain doubtful?

In the same manner, a person must have some amount of practice with the

thermometer before he is in a fit position to put an actual value on any one observation, and any error in diagnosis or prognosis which a beginner may make will be due probably to this wrong interpretation of a certain fact.

The greater his experience the less will be the chance of such an error, and the more valuable will his thermometer be to him.

I will just give two examples of numerous mistakes liable to be made by this class of objectors.

A case of febricula presents itself, and a very high temperature is found within a few hours of the first symptom of *malaise*. The observer in question necessarily thinks that his patient must be suffering from a very severe form of fever, probably typhus, and is proportionally anxious, but in forty-eight hours perhaps, to his .delight and astonishment, the temperature is again normal, and the patient convalescent. Such an observer, having considered only the abstract degree of heat, immediately discards his thermometer, although his error of diagnosis and prognosis was due to the wrong interpretation of a fact. Had his experience been greater, the very fact which so alarmed him would have had, probably, an exactly opposite effect, for he would have known that the disease could not at any rate be typhus fever.

Again, to take an opposite example.

In a case of typhoid fever, in which the general symptoms are severe, the temperature, which has been fluctuating about 103° Fah., suddenly drops 4° or 5° without any improvement in the general condition of the patient.

Such observers, considering only the abstract degree of heat, regard the altered state of temperature as a favorable sign, and are surprised at, very possibly, finding their patient dead on their next visit. Had they had more experience, they would have known that such a fall was a very unfavourable symptom under the circumstances, being probably caused by intestinal hemorrhage, or else being the commencement of a state of collapse; as in typhoid fever, the general symptoms improve considerably before the temperature reaches normal. All the blame of such unfortunate prognoses is, of course, laid on the thermometer, instead of on their own ignorance and rash judgment.

The above are examples of the misuse of the instrument, in the use of which we must always be very careful not to jump at conclusions, but strive honestly to arrive at the proper interpretation of the additional fact which we have just registered; by so doing we shall, by its assistance, reap an abundant reward in a more successful diagnosis—a more confident prognosis.

In conclusion, I am convinced that the study of the thermometry of disease is as yet in its infancy; and believing that such a study, instead of teaching any disregard for the pulse, or other important symptoms (as some have wrongly supposed it was intended to do), will further enhance their value, and generally conduce to a more attentive examination of each symptom manifested in acute disease, I consider the subject to be one well worthy the attention of every member of our noble profession, and one which will amply repay the few extra moments spent at the bedside.—*Dublin Quarterly Journal, Aug.* 1866, *p.* 60.

3.—A CONSIDERATION OF THE COURSE OF TEMPERATURE AND PULSE IN TYPHUS AND TYPHOID FEVERS, AND SOME OF THE POINTS OF DIFFERENCE BETWEEN THESE TWO FEVERS SHOWN THEREBY.

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[The cases from which the following data were ascertained occurred in St. Bartholomew's Hospital during the last two years, and daily observations were taken of them. The number of cases amounted to sixty of typhus and thirty of typhoid.]

Typhus, as met with under the above-mentioned circumstances, seems to occur generally in two forms:—1st. The milder form, the subjects of which

are children, or previously healthy adults under thirty, who have led sober and regular lives; 2nd. The more severe form, which has been the one somewhat the more frequently met with. This has occurred either in persons of a more advanced age or in younger adults of unsound condition from previous disease, or in consequence of intemperate habits.

In both of these forms the temperature rises in a more or less regular manner to its maximum, when it falls continuously about a degree a day until the normal is reached; and although having further fallen below this, it may rise to regain its ordinary height, it will not again exceed this point unless some complication be at hand.

In all cases, also, of either form there is a very uniform temperature of about 104° Fah., on the seventh day; with this exception there is no temperature peculiar to any one day.

In the milder form of the disease the pupils are seldom contracted; the tongue, although generally thickly coated, never exhibits the dry, brownish-black fur of the more severe type; subsultus is not often, floccitatio very rarely present; the delirium (which occurs only at night) is slight, and the rash is not usually very copious. In such the general range of temperature is comparatively low, the termination of the case is, without exception, favourable; and the convalescence, which may be said to begin about the fourteenth day, is rapid.

The temperature attains its maximum on the seventh or eighth days, the average maximum being 103°·7 Fah., the highest registered 104°·3 and lowest maximum 102°. The normal is reached on the twelfth or thirteenth days.

In the more severe form we often find contracted pupils, a dry, brownish-black tongue, with sordes on lips and teeth, great subsultus and muscular tremors, often floccitatio, delirium frequently present by day as well as night; and towards the termination of the case, a semi-comatose condition often comes on, which occasionally alternates with severe delirium at night. The rash in these cases is generally copious. Under this form I include those exceptional cases of typhus which are attended by considerable diarrhœa; these occur in about ten per cent. of all cases, and do not in any other respect differ from ordinary severe cases of the fever.

In the severe form, then, the range of temperature is high, the termination not always favourable, and the convalescence, which does not begin until the end of the third week, is very tedious.

In these cases the maximum temperature is attained between the seventh and tenth days (generally on the seventh or eighth), the average maximum is 104°·4 Fah., highest registered 105°·6 Fah., lowest maximum 103°. Normal is reached between the fifteenth and eighteenth days, both inclusive.

High temperatures, such as 105° Fah., and upwards, do not foretell fatal terminations; but high ranges, generally, at the commencement of cases foreshow severe attacks, and are invariably followed by long convalescences. Fatal cases always exhibit abnormal temperatures prior to collapse, but not necessarily very high ones. Judging from the fatal cases I have witnessed, I believe that an abnormal course of temperature much more generally precedes a fatal termination than any unusually high range.

Such cases have appeared to differ from the ordinary run of severe attacks terminating favourably in one or more of the following ways:—

1st. They exhibit a temperature of only 102° or 103° Fah. about the sixth day, which is below that generally met with even in mild cases; and considering the severity of the symptoms we should expect to find a temperature nearly 2° higher at such a date.

2nd. They have a constant temperature of about 102° Fah. for a week or more.

3rd. They exhibit a fall of perhaps 3 or 4° Fah. on some day, which, in an ordinary severe case, we should not expect any such fall (say on the tenth day).

4th. They have a temperature of about 104° Fah. as late as the sixteenth day, when even in severe cases the normal ought to be nearly reached.

The pulse generally in typhus rises and falls with the temperature; and between the fourth and ninth days is above 100, often very considerably so; its maximum is reached rather later than the temperature, and normal is attained some two or three days after this point of temperature has been arrived at.

It may, however, especially in persons of nervous temperament, be kept up beyond this date.

In typhus a temperature of 99°·5 Fah. corresponds to a pulse of about 100, a temperature of 100° ·5 Fah. with a pulse of 105, and so on; an alteration of five beats of the pulse corresponding to each degree of alteration in the temperature.

In the majority of cases, however, unless the alteration of temperature be upwards of one degree, we shall find, probably, no corresponding increment or decrement in the pulse, and the above only holds good in a general sense.

I have, however, noted down each variation of 2° and upwards in all cases of typhus which I have, in order to ascertain the contemporary behaviour of the pulse; and find that every such variation was attended by a corresponding alteration in the pulse of an average of five beats for each degree. There were only five exceptions to this rule out of the whole number, and in two of these the variation in pulse occurred the next day without any corresponding alteration of temperature.

In concluding these observations on typhus fever I should mention that by far the most frequent complication in these cases was bronchitis, coming on about the twelfth day.

Considerable feebleness of the cardiac systole and impulse was also noticed in several instances.

The fatal cases amounted to about twelve per cent., and occurred either within the first week or else between the twelfth and sixteenth days.

In the former case the deaths seemed to be due to the intensity of the fever poison itself, and in the latter to the circulation in the system of the products of tissue metamorphosis. In only one case, however, were typical uræmic convulsions observed. These fatal cases occurred in patients over 40, or in adults above 25 who had led irregular lives. The proportion of male to female deaths in the same number of cases was 7 to 5.

At the *post-mortem* examinations of these cases ulceration of Peyer's glands was never present, and the only peculiar appearance noticed was a dark fluid condition of the blood, and occasionally a dark and abnormally dry condition of the muscles. In one case there was a remarkable effusion of dark fluid blood into the substance of the recti muscles of the abdomen.

The enlarged congested liver and large soft pulpy spleen have been met with both in typhus and typhoid. I will now proceed with the consideration of typhoid fever, which has been met with under two forms of such unequal severity, that I propose for convenience sake to divide the cases as I have done those of typhus, into two classes; one comprising the milder, the other the more severe form.

I should, however, observe that although a severe case of typhus may often be foretold at an early period, yet it is impossible to do so at a similar date in typhoid fever; as I have observed several in which the mildness of the symptoms during the first week or ten days might have augured an early convalescence, eventually turn out the most protracted character.

In typhoid fever the temperature generally rises, after numerous daily fluctuations, to its maximum; and having attained this point exhibits the same characteristic irregular decline, falling perhaps for two or three consecutive days, and then rising again for two or three more, and so on; the fall, however, preponderating over the rise, until the normal is reached, after which daily fluctuations will probably continue for a few days longer. The majority of cases come under the first mentioned form, ultimately proving of moderate severity, and terminate favourably towards the end of the third week.

In these the pupils are slightly dilated; the tongue, although inclined to dry, and generally abnormally red at the tip and edges, often continues nearly clean throughout. A very common form of tongue which I have observed in

such cases has a rather dryish patch, in the form of an isosceles triangle (the base of which is at the tip), running up the centre, with two moist strips of thin white fur on either side. Subsultus and tremors in these cases are rare, and delirium (as often absent as present) is usually very slight, and comes on during the night only. Intestinal hermorrhage does not occur, and thoracic complications of importance are rare.

In these the temperature attains its maximum between the seventh and eleventh days (but this is not reached more frequently on one day than on another); the average maximum is 103·3 Fah.; highest registered 104°·5, lowest maximum 102°·2 Fah. The normal is arrived at between the fifteenth and twenty-first days.

In the more severe form we generally find that either intestinal hemorrhage occurs during the course of the case, or that we have to deal with a low form of pneumonia, which is a frequent complication, and one which not uncommonly is the immediate cause of death at an advanced period of the fever.

In these protracted cases we get, towards the later stages, dilated pupils, a tongue which is either covered with brownish black fur, and dry, or one which has its central surface glazed, edges and tip red. In both of these transverse furrows may generally be observed. Subsultus and tremors may also be met with, but very rarely floccitatio; delirium, usually of a low form, is pretty constant at night, but rarely present during the day.

In such cases which terminate favourably the temperature reaches its maximum between the nineteenth and twenty-first days, the average maximum is 104°·1 Fah.; highest registered 105°·2, lowest maximum 103°·8 Fah. The normal is reached usually between the twenty-third and thirty-fifth days.

In typhoid fever a high range within the first fourteen days generally foretells a severe and protracted case, but a low range during this period does not necessarily foreshow a mild case, even if the general symptoms be also favourable.

A sudden fall of several degrees, especially if occurring in a severe case, about the end of the second week, and without improvement in the general symptoms, is to be considered with anxiety, such decline being probably due to intestinal hemorrhage, or to the commencement of a state of collapse.

In such an event the pulse, which very likely up to this time may have kept below 100, usually rises suddenly twenty or thirty beats.

In these cases, when the patient does not immediately succumb, the fall in temperature and rise of pulse are frequently followed, within the next twenty-four hours, by opposite phenomena, the temperature rising higher than the point at which it previously stood whilst the pulse falls considerably.

Again, if we meet with a case in which the general symptoms continue severe, but the temperature, although an abnormal one, fluctuates for some days at a point disproportionally low when compared with the general symptoms, we must consider such low range in an unfavourable light rather than the opposite; especially ought this behaviour of the temperature to be so interpreted if it occur in a case of which the date of the commencement of the fever is unknown or doubtful, and in which the period may then be as late as the end of the third or the fourth week.

Almost without exception in cases which terminate favourably, we find that the general symptoms reach their normal, if I may so speak, several days before the temperature; and although until all fluctuations of the temperature above "the normal" have ceased, the patient cannot be considered safe from liability to a relapse, and great care must be still taken with his diet; yet we may expect in the majority of cases, that if the general symptoms have thus improved we shall have a favourable issue, notwithstanding the slight fluctuation of the temperature above "the normal."

It is the knowledge of this fact that causes us to look with suspicion on cases in which the normal temperature is apparently about to be arrived at before the improvement in the general symptoms. Fatal cases often exhibit a continuous, although often slight, daily rise in temperature for four or more days previous to collapse, and this may occur without any corresponding

alteration in the pulse, or without any decided change in the general symptoms.

As we know that a continuous rise for four or more successive days is not met with generally in cases which end favourably, such a rise should put us on our guard.

In typhoid the pulse, to a considerable extent, fluctuates with the temperature, although the exceptions to this rule are much more frequent than in typhus.

However, generally speaking, an alteration of about five beats of the pulse occurs for each degree of alteration in the temperature. Thus, a temperature of 99°·5 Fah. will correspond to a pulse of 90; a temperature of 100°·5 with a pulse of 95, and so on.

The range of pulses which may be found in different cases, to correspond to the same degree, is, however, very great; thus, between 102 and 103° Fah. I have met with pulses between 80 and 154.

High pulses in typhoid fever do not often occur in adults; and when such are not clearly due to some manifest complication, there seems some reason for believing that tubercular deposit in the lungs, or the general state of tuberculosis, is the cause of this phenomenon.

Fatal cases have occurred in 13 per cent. of all cases, and the proportion of male to female deaths, in the same number of patients, was as 5 to 4. Death took place on the fifteenth, thirty-fifth, and thirty-sixth days, and also in one case on the sixteenth day, of a relapse; besides these cases, the date of death in another patient could not be ascertained, but it was not earlier than the fifteenth day, and very probably took place at a much more advanced period of the disease.

The cause of death was due either to peritonitis, a low form of pneumonia, or asthenia.

In all there was well marked ulceration of Peyer's glands. A low form of pneumonia was the most common complication, and in several cases the fever commenced with some inflammatory affection of the throat.

In all cases diarrhœa was all but universally present, at some time in the course of the fever, although in many constipation prevailed for the first fortnight.

Considerable hemorrhage occurred in four cases. Relapses took place in 12 per cent. of all cases. I will now conclude by summing up the differences most frequently observed between these two fevers, as far as their pulses and temperatures are concerned.

1st. The range of temperature is somewhat lower in typhoid, in which, however, a continuous abnormal temperature is of much longer duration.

2nd. The defervescence of typhus is regular and continuous, the temperature falling generally about a degree a day, until the normal is reached; whereas in typhoid, the fluctuations from day to day are considerable, and the fall is not a continuous one daily.

3rd. There is a great tendency in typhus to attain certain temperatures, and to reach certain points in its course, on certain fixed days. Thus, in the great majority of all cases, a temperature of about 104° Fah. is met with on the seventh day; in a very large percentage the maximum is reached on the seventh or eighth days; the normal is generally attained, in mild cases, on the twelfth or thirteenth days; and in more severe ones between the fifteenth and eighteenth days.

In *typhoid* there is no particular temperature generally arrived at on any one day; the maximum may be reached at any time between the seventh and twenty-first days; and normal is attained, in mild cases, between the fifteenth and twenty-first days; whilst, in the more severe ones, it may be attained on any day between the twenty-fourth and thirty-fifth.

4th. The pulse is generally less frequent in typhoid; and although in both fevers the pulse usually fluctuates with the temperature (about five beats of pulse corresponding to each degree of alteration in temperature), the frequency of the pulse in the two, for the same degree of altitude, is different.

Thus, with a temperature of 100°·5 Fah., we shall get an average pulse of

about 105 in typhus, but of only 95 in typhoid, and so on; at each degree the pulse being about ten beats more frequent in typhus than in typhoid. Moreover we sometimes meet with a case of typhoid fever in which the pulse very slightly exceeds normal throughout, but such a case I have not observed in typhus.

5th. In typhus the temperature reaches normal two or three days before the pulse, and the general symptoms often continue severe several days after the pulse and temperature are both normal. In these cases, however, if the defervescence has been regular, and has occurred about the usual period, the case will terminate favourably, notwithstanding the often very unfavourable condition of the patient.

In typhoid, on the other hand, as I have before mentioned, the temperature keeps up several days after the general symptoms have been considerably improved, and we must look with doubt rather than otherwise, on cases in which this rule appears about to be broken—that is, on cases in which the general symptoms continue severe, although the temperature is but little, if any, above the normal

6th. Relapses of typhoid have occurred in 12 per cent. of all cases, and in these the temperature ran a similar course as in the former attack, although at a somewhat lower range.

Relapses of typhus, with a corresponding recurrence of abnormal temperature, have never been met with, although the number of cases of typhus under observation has been double that of typhoid.—*Dublin Quarterly Journal, Aug.* 1866, *p.* 71.

4.—ON THE INFLUENCE OF ALCOHOL ON THE TEMPERATURE OF FEBRILE AND NON-FEBRILE PERSONS.

By Dr. Sydney Ringer, Professor of Materia Medica at University College, and Assistant Physician to University College Hospital; and Dr. Walter Rickards.

In this paper the authors give the result of some observations on the influence of alcohol on the temperature of non-febrile and febrile persons, and a few on rabbits. The authors gave alcohol in poisonous doses to three non-febrile adults. The temperature was greatly depressed in two. The depression amounted to 3° Fahr. In the third case the temperature was but little influenced. The subject of this observation was a confirmed drunkard. He confessed to getting drunk whenever he had the opportunity.

Alcohol was also injected into the rectum of two rabbits. In both the temperature was considerably depressed. The depression amounted to 15° Fahr.

The authors therefore conclude that alcohol in poisonous doses causes a very considerable depression of the temperature of the body of non-febrile persons, and also that it is probable that habit obviates this effect. Further proof in favour of this latter conclusion is given in a subsequent part of the paper.

The rapidity of the fall of the temperature after death of two patients and one rabbit was ascertained. This is compared with the rapidity of the fall of the temperature after the use of alcohol. It was found that the temperature falls as rapidly after the use of alcohol in poisonous doses as after death. The circumstances determining the cooling of the body, however, differ in the two conditions. Thus during life much heat is carried off by the air inspired into the lungs. Assuming that the cooling effects of respiration are equal to those that result from radiation from the surface of the body, it follows that alcohol possesses the power to diminish by one-half those processes that produce the heat of the body.

Both of the patients whose temperature was depressed suffered from nausea and vomiting. In order to ascertain if the depression of the temperature were due to the conditions that accompany vomiting, tartar emetic was given to a patient every ten minutes, and continued long after vomiting was produced. The administration of the antimony was continued seven hours.

No depression of the temperature resulted. Thus the authors concluded that the depression of the temperature was not due to the vomiting produced by the alcohol.

Alcohol was next given, in ordinary doses, to non-febrile persons. Eleven observations were made. In eight the temperature was depressed. In three cases the temperature was unaffected. These three persons were strong adults. The quantity of alcohol given them was small (an ounce of brandy). Two of them were confessed free drinkers. The amount of depression was slight. The authors thus conclude that alcohol, when taken in ordinary quantities by non-febrile persons, causes a slight depression of the temperature of the body, but that the amount of depression which occurs is too slight to contra-indicate its use.

Numerous observations were made to ascertain the influence of alcohol on the temperature of febrile persons. To some of the patients very large quantities of alcohol were given. To a child of twelve years old eleven ounces of absolute alcohol were given on one day. From these observations the conclusion is drawn that ordinary and extraordinary quantities of alcohol cause only a slight and temporary depression of the temperature of febrile persons, and consequently alcohol cannot bring the temperature of febrile patients to that of health. But if alcohol should be indicated by the general condition of the patient, it will also to some extent act beneficially in virtue of its power to cause some diminution to the temperature of the body.

Some observations were made to ascertain the influence of alcohol on the pulse. From these the conclusion is drawn that alcohol increases the force of the pulse, but lessens its frequency.

In conducting these observations the following precautions were taken: the patients were kept in bed; all the conditions were kept the same; the thermometer was kept the whole time in the axilla, and the temperature was noted every few minutes. The observations were continued many hours—in some cases during the entire day.—*Lancet*, *Aug.* 25, 1866, *p.* 208.

5.—A CASE IN WHICH MEASLES AND TYPHOID FEVER WERE COINCIDENT.

By W. B. Kesteven, Esq., Holloway.

On the 14th, 15th, and 16th of last December, a girl, aged 14 years, was ill with measles. A few days afterwards another girl, aged 11 years, was indisposed, and suffering from symptoms of fever of the enteric type. On or about the 30th of December, a few of the rosa-coloured spots characteristic of typhoid fever made their appearance, and increased in number, but did not exceed thirty or forty over the whole of the trunk. On the 8th of January, two younger children presented the ordinary symptoms and eruption of measles, and passed through the disease in the usual course.

On the 8th of January I was considerably puzzled by finding my typhoid patient exhibit the general symptoms and special rash of measles in addition to that of the enteric fever. I began to doubt the correctness of my diagnosis as to either the one or the other of the two diseases, and was, therefore, only too glad to avail myself of the superior judgment and greater experience of Dr. Jenner, who, after careful investigation into the history and condition of the patient, confirmed my opinion that I had here a case in which these two eruptive fevers were coincident. At the same time my doubts were more than justified by Dr. Jenner's statement that he had only once before met with such an occurrence. The rarity of such coincidences is, therefore, obvious; but their occasional occurrence has been recorded. Thus Mr. Broke Gallwey published in the Lancet of the 28th of August, 1858, a case of small-pox supervening on measles, and another on scarlatina. In the *Journal of Public Health* for October, 1856, is published a paper of my own, read to the Epidemiological Society, and in which I describe a series of cases wherein measles and scarlatina were concurrent. Doubtless other instances of the same kind have happened; but I have notes only of the above.

It may not be uninteresting, with reference to etiology in the above case, to add that exactly opposite the house in which it occurred there is one of the ventilation gratings of the street sewer. I do not doubt that these openings have much to do with the spread of typhoid fever in the suburbs of London. I have been in practice in this place nearly thirty years, and for upwards of twenty years of that period I never met with a case of typhoid fever. Since the new sewers have been made the cases have become very numerous. Doubtless it would be a great benefit to do away with cesspools in crowded districts; but it is doubtful whether, as at present constructed, without ventilation shafts, the sewers are anything better than elongated cesspols, diffusing through their air gratings the causes or abettors of various forms of disease.—*Lancet, June* 9, 1866, *p.* 619.

6.—ON THE CAUSES OF DISEASE.

By F. C. Skey, Esq., F.R.S., Consulting Surgeon to St. Bartholomew's Hospital.

If you inquire into the recent history of a person suffering from disease or illness, whatever form almost it may assume, you will learn of some event or circumstance of recent occurrence that has drawn more or less suddenly whether on his circulating or nervous system, by which the vital powers of his body have been reduced. This condition is commonly known under the term exhaustion, and is the result of a sudden draught on the powers of the constitution, by which the relations hitherto existing between the physical frame and the powers of life inhabiting it, are for the time deranged.

So long as health is undisturbed by any counteracting agency beyond the natural wear and tear of time, life will be prolonged to its full term of years, but in our path through life we are liable to disturbing influences which destroy the equilibrium. These accidents draw on the vital powers and reduce them below the level of standard health, and disease follows as an almost certain result. Let us suppose a man to consume each day a given amount of food. Accident deprives him of a portion of this food, which I will conclude equal to one-half of a day's ordinary consumption. To this amount he fails in the supply of material of blood making, and his circulation is weakened in proportion. That man has become more susceptible of disease, in a ratio with his loss of blood, than he was prior to the occurrence.

Another man, under circumstances whether of choice or compulsion, sustains an unusually great and prolonged physical effort, whether in walking, or riding, or in rowing, of which we see abundant examples in the annual folly of the University boat race. Inasmuch as the serious consequences of these physical efforts, on which the reputation for learning of the great Universities of England depends, are remote, they are not detected. I have seen several examples of disease developed in men who have undertaken a walking tour in Switzerland, who have overtasked their powers of endurance, have returned home exhausted by the effort, and have been laid up ill for months.

Any cause which tends to reduce the quantity of blood in the system, whether by direct abstraction or by deprivation of food as the source of blood, reduces the vital powers, and disease or illness in some form is the consequence. The same principle is involved in the defective supply of oxygen to the lungs, and indeed is applicable to any and all causes that either reduce the blood in quantity or impair its strength for circulation. Any great and unusual physical effort reduces the powers of life in proportion to its degree, more especially when coupled with loss of sleep. Exposure to cold, when severe or prolonged, is a source of subsequent derangement of health, and among other causes may be included either shock to or exhaustion of the mental powers, such as great anxiety of mind or mental emotion, and laborious and continued mental labour. Of the above causes of disease, direct or indirect loss of blood and deficient food are the most common; and although I have above referred to them, as also to the remaining causes, as sudden, they may be more or less chronic both in their nature and in their

consequences. I referred rather to sudden and severe illness or disease as the result of some sudden and palpable change in the routine of life of the individual, in which the evidence of cause and effect is conclusive. I believe, then, that in the large majority of illnesses you may trace back the malady, be it what it may, to one or other of the above incidents as its direct and obvious cause; and as certainly as one or the other of these causes has existed, you may with reason and probability look out for its result in some early attack of illness, medical or surgical, local or constitutional. Whatever function or structure is most liable to derangement, the consequences fall upon it in the first place. It may be diarrhœa, or pneumonia, or abscess, or erysipelas, or rheumatism, or general debility. If you will adopt the habit of tracing back the recent history of any or every patient you prescribe for labouring under disease, you will learn something bearing upon it of the nature I have referred to, some effort overtaxing the physical powers or reducing the circulation or nervous powers of the system; and if so is it not a reasonable inference that all disease begins by a stage of *weakness?* The first link in this chain consists in a reduction of vital power, from which reduction the effort of the physician or surgeon consists in restoring the lost power and bringing the patient back to the standard of health. In illustration of these principles I will relate a case that occurred to me recently. A healthy lady, of about 34, consulted me on account of an abscess in the breast. I concluded she was suckling a child, but I was mistaken. Anxious to ascertain the cause of so unusual an occurrence in an apparently healthy person, I made every inquiry into her past recent history. Have you had a blow on the breast? No. An attack of illness? diarrhœa? any unusual or excessive loss of blood? any great muscular effort or loss of food? All these questions she answered in the negative, and I was about to relinquish my inquiry when the lady said, "Perhaps I ought to tell you that a few weeks ago I sat up seven successive nights with a dying child." I thanked her for such important information, and the mystery was solved. Why should this lady have abscess in the breast? She had not borne a child for many years. There must be some cause for abscess, local or general. It might have been produced by a blow, but it was not. Investigation proved it to be the result of sudden reduction of her vital powers by great physical and mental effort. Why it assumed this particular form I know not. I only know that a great cause of derangement of her system had occurred, and the consequence fell on that particular organ. The late Lord ——, whose recent and sudden death caused so painful a sensation, became the subject of phlebitis consequent on severe bodily exercise with a pulse of 50, which no amount of stimulus could raise above it so long as he subjected himself to this daily effort. Here is exhaustion as the cause, phlebitis the effect, and sudden death by embolism.

Inflammation of the uterus or of the venous system below it follows hemorrhage in parturition. Accoucheurs with large experience will confirm this fact.

Many years ago I was present at the attempt to reduce a dislocation of the femur in a London hospital. The man, who was to all appearance in perfect health, was bled largely from both arms and from the temporal artery. He also took tartar-emetic to the extent of some fifteen grains. The quantity of blood abstracted from his circulation must have rendered the functions of the heart a sinecure, for it amounted to 120 ounces. He survived a week, and died of phlebitis, as I had predicted.

I might multiply these examples, but it is unnecessary if you comprehend the force of the cases I have quoted. The causes of disease I refer to above may be classed as follows:

1. Loss of blood, whether accidental or effected at the hands of science; catamenial, hemorrhoidal, &c.
2. Loss of food, or failure of the material of blood making.
3. Excessive purgation, whether natural and spontaneous, as in diarrhœa, or artificial at the hands of science, carrying off nourishment.
4. Breathing impure air, by which the quality of the blood is deteriorated.
5. Loss of sleep.

6. Excessive muscular effort, as in walking great distances, boat-racing, &c.
7. Extremes of temperature, especially of cold.
8. Great mental emotion or mental shock.
9. Protracted anxiety of mind.

Of the above sources of subsequent illness or disease, the influence of the four first is received more directly by the vascular system, the five latter either partially or entirely by the nervous.

Before speaking of the general treatment of disease, to which I shall shortly come, I wish to say a few more words on the subject of some prevailing doctrines which are so generally adopted by our profession, and the entire soundness of which appears to me yet open to question and inquiry. Why do you order an aperient in nearly every case of disease you are called to see? If the patient is strong and vigorous, the dose is a full one—if weakly, a milder form; but always an aperient, and generally it is combined with mercury, which indeed forms the staple of the medicine all but universally prescribed. As we commonly go at once to the cause, and prescribe our best remedy, the natural inference is that there is either liver or intestinal derangement as the cause of the disease. You say you desire to unload the liver and to remove extraneous and irritating matters from the intestinal canal; and very good treatment too if the liver is at fault and the alimentary canal demands that kind of relief. But what evidence have you of it? You say the liver is congested. It is a term in the mouth of nine-tenths of the profession practising medicine and surgery in the dominions of her Majesty the Queen. The practitioners on the Continent of Europe take a different view of these matters, and not without some show of reason, for English doctors, though I entertain the highest respect for their attainments, do not monopolise all the knowledge of the world. In discussing the subject, I am prepared to acknowledge the occasional presence of constipation as the result of torpid action of the bowels, in which condition the liver may, or may not, be involved; but I am myself unable to detect what appears so obvious to others—a congested state of this organ calling for large doses of chloride of mercury, supposing that form of drug to be the best corrective of the evil. As I believe a person who is the subject of disease, itself so commonly the product of exhaustion, should not undergo further reduction of his strength without a good and sufficient reason, and as I doubt the congested state of the liver and find the torpid condition of the large intestine, if it exist at all, an evil on a small scale, I prefer to look to the disease itself (suppose it, if you please, erysipelas or any other malady), and if the pulse is soft and compressible indicating distinct constitutional weakness, *and not otherwise*, I prescribe at once a tonic remedy. I look upon this torpid condition of the large intestine—for, observe, nearly all constipation is limited to this part of the alimentary canal—as merely a symptom of the general debility, and increased by loss of appetite and the absence of food, and is not to be rudely and violently assaulted by drastic purgatives; and one of the first signs indicating the sound principle of a tonic treatment will appear in the gradual, but certain, restoration of the functions of the alimentary canal to a state of health. Constipation is very commonly, though not invariably, the concomitant of weak health and low vital power; and is caused by defective power of the muscular fibres of the large intestine, which are, when compared to the small intestines, very limited in quantity in relation to the size of the intestine. You treat constipation by means of purgatives which act on the mucous membrane only. I prescribe iron, to give tone to the muscular coat. Your treatment affords a temporary and transient benefit; mine is a permanent one. Which will you prefer? And this subject leads me to add a few words on the treatment of disease adopted by my own respected teacher, Mr. Abernethy, who upheld the doctrine that health demanded the daily action of the bowels, and that the liver was an offending organ and demanded the daily administration of a stimulant or a supposed provocative to the secretion of an increased quantity of bile. No doubt Mr. Abernethy's treatment was to an extent successful because, as the tendency of the large majority of diseases is towards reco-

very at the hands of Nature, his cases prospered like those treated on other principles. In these days one does not quite comprehend how a man of Mr. Abernethy's grasp of intellect could delude himself with the idea either that disease could so generally depend on torpidity of the liver, or on imperfect action of the muscular coat of the large intestine. If it be necessary to obtain, as the requisite condition of health, a daily action of the bowels, why did nature give us large intestine sufficient to contain at least a week's consumption of food.

In cases of extreme weakness good service is often rendered by "locking up" the bowels, and reducing their action to that of alternate days.

I considered the treatment of the great majority of diseases to consist in increasing the quantity of healthy blood and giving force to the action of the heart. *You can't cure disease with a feeble pulse.* Mend the pulse, and Nature will do the rest of the work. On this principle disease in general may be treated, so far as my observation has gone, with pre-eminent success. In order to appreciate fully its force, you must start with the conviction that Nature cures and not man—man removes obstructions from her path, and nothing more. This done, he awaits the onward move of the great machine, like to a great ship of gigantic weight, which, quietly held in her position at rest by a few timbers, immediatly obeys the great natural law of gravitation on their removal, and glides into the water below. Did man launch this vessel, or did Nature? With as much title may the physician or surgeon declare that he cured a disease. There are of course occasional exceptions to this assertion in some cases of operative surgery. The object of treatment is to restore the pulse to its normal standard of force and frequency. Give it due force, and the heart will determine the number. As a rule, in cases of debility, it is too frequent, and frequent because the quantity of blood in the system is below the standard of health. Increase the quantity, and the pulse falls. Assure yourself of this. Unthinking persons jump to the conclusion that brandy or other stimulants necessarily raise the pulse, but this supposes that we start with a healthy pulse at par. I am talking not of health but of disease. In my capacity of Examiner at the College of Surgeons, I often put this question. If you take a pint of blood from a healthy man of 40, with a standard pulse of 68, what effect will be produced on the number of pulsations by the loss? What do you imagine is the frequent reply? "It reduces the number to 60!" And this curious answer explains something of the phenomena of venesection so universally practised some years ago, when in reporting on a case it is said "His pulse rose on bleeding, so I bled him again." As a rule, you will find that whenever the frequency of the pulse is above the standard of health, *as an indication of debility*, a stimulant will reduce it. I tried this experiment, or rather I obtained this test, for it was not an experiment. On coming out of a Turkish bath of something more than the usual intensity of heat, my pulse had risen to 90; I drank about two ounces of wine, and my pulse fell to 75 within a few minutes.

I have something more to say on common matters relating to the routine of every day's practice. There is great repugnance prevailing in the medical mind to the employment of stimulants. It is, perhaps, mainly founded on the moral evils of excess. Inebriety is a low, vulgar vice, and therefore the agents producing it are morally objectionable and medically injurious; but you must draw a distinct line between health and disease. In health I am the advocate, both in precept and example, of moderation, in disease not. I think one reason why stimulants are so little resorted to in cases of debility is because, being administered in hesitating quantities of doubtful utility, their value is not appreciated. You must not gauge the capacity for alcoholic stimulants in disease by the capacity of the same person in health. Those only who adopt this treatment as a principle are cognisant of the remarkable tolerance of stimulants under great prostration of the vital powers, and when required as the antidote to prostration I maintain they are perfectly harmless. It is the remarkable tolerance of alcoholic stimulants in these persons to which I wish to direct your earnest attention. You cannot intoxicate these people; you cannot even unduly excite them. It is a

common remark among observant persons under treatment, "I drank three glasses of wine, but it had no more effect on me than so much water;" whereas less than the same quantity during health would have produced partial intoxication, or at all events excitement. These are the persons who demand the free and fearless resort to stimulants, and to whom alcohol is life. Do not, I again urge upon you, measure the quantity to be administered by the glass. Gauge it by its effects, and so long as weakness prevails, indicated by the pulse, persist in its use; and as you proceed in your treatment, and the services of the wine become more and more palpable, you will not fail to see that its consumption becomes less and less essential to onward progress, and in the course, it may be of months, of weeks, or even of days, you will reduce the quantity to the standard of health, for the capacity for wine has passed away with the disease that claimed it. You need never listen to the objection often urged that the resort to stimulants will become habitual; be assured it is entirely groundless. Now listen to the following examples of this principle of treatment. A young lady whose daily consumption of wine has never exceeded two glasses, oppressed by the heat of a crowded room, faints. The heart and the brain have failed in their functions by reason of the imperfect oxygenation of the blood. Recovering from the first stage of sudden depression of her vital powers, her symptoms pass into those of hysteria. We have all witnessed cases of this kind. Ordinary and mild stimulants are unavailing, and make no impression. An hour, two hours, have elapsed, and she is yet prostrate. Before her recovery this girl has consumed three wineglasses, or upwards of half a pint, of brandy and other cordials, and often more. What is the explanation? What is the physiology of this? Had you administered this quantity to your patient during health, you would have done her a serious injury. She now takes it with benefit and with impunity. The shock to her system was for the time dangerous; the stimulant, given at another time, would have proved dangerous also; the two united are harmless. The one has balanced or antagonised the influence of the other. There remains neither headache, nor nausea, nor any evidence of excess, because all the stimulating power of the brandy was required and consumed in re-establishing the circulation. Again:—A gentleman of abstemious habits, ill-clothed for the occasion, ventured, in a cold season of the year, to mount to the summit of a mountain in Wales. He was seized with intense and sudden prostration from the effects of the temperature. His suffering was severe. At this opportune moment, a friend supplied him with a half-pint bottle of raw brandy, every drop of which he drank at a draught, as he would have drunk a glass of table beer. The only effect produced on his system was warmth. He drank more brandy at that moment than he had ever before consumed in a week. No evil resulted. The cold and the brandy being in antagonism, each entirely neutralised the injurious effects of the other. I need not say that a similar draught, unprotected by the depressing influence of the intense cold, would have proved almost dangerous to life itself—certainly most injurious to health. I attended in his last illness the late Duke of ——, a man of remarkably abstemious habits. His malady was a mortal one. Some months prior to his death he became the subject of frequent attacks of rigors, which continued with great severity for two or three hours, and left him in a condition of extreme prostration. I called one day opportunely, and found him labouring under one of these attacks. I gave him two-thirds of a wineglassful of raw brandy without effect. In five minutes I repeated it, and he took a wineglassful of brandy every seven or eight minutes till the attack passed off. He had then consumed three-quarters of a bottle of pure brandy within an hour. I saw him in four hours afterwards, apparently well. In reply to my question, "How do you feel?" he answered, "Well, I think you gave me pretty large doses of brandy, but I cannot say I feel in any respect the worse of it." Nor was he. Throughout his subsequent illness he had no attack of rigors. The prostration of the vital powers in this case must have been immense. One of the last cases attended by a late eminent physician—now, unhappily for the cause of medical science, lost to the profession—was a gentleman of

about 30, who was the subject of hydrothorax. His case was urgent, and I was requested to see him. Concurring in opinion with the physician in attendance in the necessity of giving immediate relief by operation, I punctured the chest and got away six pints of serous fluid. The cavity thus made was entirely occupied by atmospheric air, to the admission of which I have never yet ascertained the grounds of objection or seen any injurious result therefrom. I have done this operation often, and have never considered it desirable to exclude the air from the cavity within. Though irrelevant to my subject, I cannot forbear asking the simple question, What is supposed to occupy the space from which the fluid has been removed? Certainly the lung will not immediately expand, and the walls will not collapse for a period of weeks or months. At the conclusion of the operation the patient was much exhausted, with a pulse of 130. It was a great object in the treatment to reduce it. What means would you have adopted? what does professional usage demand! Salines, think you, or purgatives? No, on the contrary. He took the only remedy that could have probably saved his life. He was ordered 1 oz. of brandy dilluted with an equal quantity of water every three hours, and on the day following his pulse had fallen to 90 and he recovered. If this treatment was not sound, it ought to have proved fatal. I have abundant examples at hand of the efficacy of this principle, but I have quoted sufficient for my present purpose. They go to exemplify this therapeutical principle, viz.: 1. That stimulants alone can restore the vital powers under great and sudden prostration; and 2. That under great and sudden prostration the capacity of the system for stimulants is enormous, and may be administered to almost any amount with safety.

Now, gentlemen, in the prosecution of your profession, while engaged in the study of by far the most critical department of medical education—the nature of disease, or diagnosis—have you ever thought of the important distinction which exists between the diseases of animal and organic life? And yet they are worth considering. A few years ago I made some calculations on the subject of the relative quantity of blood supplied to each. I have not these calculations at hand, but the quantity of blood so distributed is nearly equal, though rather the larger proportion supplies the structure of animal life.

The nerves, as you know, are essentially different, animal life being spinal, organic life ganglionic. If we take the whole material of the body into the calculation, the structures of organic life do not exceed one-tenth of the actual weight, yet they receive nearly one-half of the whole quantity of arterial blood.

The "two lives," as they were termed by the great French physiologist, Bichat, are more or less independent of each other, both in health and disease. The diseases of organic life are more serious, because they involve structures more essential to life itself, and the derangement of any one of them involves the whole system more thoroughly than does a similar amount of disease in the structures of animal life.

You will hear a man say "he can't have much wrong with him," because he is capable of great exercise, and can walk any reasonable distance. This is a bad test. So long as the muscular system is not directly involved, and sufficient blood is made to supply both it and the spinal cord from which it derives its nerves, a man may labour under a considerable amount of disease of the structures of organic life without his muscular system being involved. When we speak of a man's "health" in general terms, we refer instinctively to the functions of the interior of the body or of the organs, not of the muscular system; we refer to the functions of the brain, to respiration, to circulation, to digestion, and the assimilation of food, &c. The muscular is but subservient to these other organs which really constitute life itself—*Medical Times and Gazette, July* 21, 1866, *p.* 55.

7.—ON CATCHING COLD.

By Dr. Thomas Inman, Physician to and Lecturer on Medicine at the Liverpool Royal Infirmary.

Catching cold is a common phrase for an attack of catarrh, but it is a very incorrect one.

One year I suffered so very severely from a series of "colds" that my attention was drawn specially to them. I was then Lecturer on Medicine, and nearly every night from five o'clock to six during the winter months had to turn out from a warm room to go through all weathers, lecture for an hour in a theatre heated by a stove and lighted by gas, and then return again to my snuggery at home. When I felt a fresh cold beginning, I tried in vain to account for it, until I accidentally saw in Copland's dictionary that the most fertile cause of a cold was coming from a moist cold air to a hot and dry room. This at once explained to me the reason of my frequent suffering, for I had invariably gone into my hot room straight from the cold. I, of course, soon changed my habit; I dawdled in the hall while taking off my great coat, perambulated the rooms which had no fire in, went up and down stairs and the like, ere I went into my study, whose temperature was also reduced. Since then I agree with a friend who says, "that a cold comes from catching hot;" and I am disposed to think that there is a strong analogy between a chilblain on a child's toes and a cold in a person's nose, throat, and lungs.—*Medical Mirror, Aug.* 1866, *p.* 460.

8.—ON THE TREATMENT OF RHEUMATIC FEVER.

By Dr. J. Birkbeck Nevins, Liverpool.

[The fundamental principle in the treatment of rheumatic fever is that recommended by Dr. Heberden above a hundred years since, viz., the employment of cinchona, in consequence of the resemblance between rheumatic fever and ague, as shown in the rigors, hot and sweating stages, and tendency to periodicity in both diseases.]

Case.—W. J., aged 45, a delicate looking man, steward of a steamship, had been suffering from rheumatic pains for a fortnight, but had gone about his work with difficulty until two days before his arrival in Liverpool, during which he was confined to his berth, unable to help himself in any way. He was carried on shore, and I saw him in the evening. He was unable to turn in bed, or to move hand or foot, except his left hand a little, though even that was acutely painful. He had had no sleep for two days or nights; tongue furred; lithates in urine; pulse moderately excited, but no distinct heart-symptoms; not much sweat.

Treatment.—He was immediately ordered a vapour-bath of vinegar, with subsequent cold douche in bed, and ten grains of Dover's powder, which was followed by two hours of sleep, and such abatement of pain, that he said he was easier the next day, though still unable to move his limbs or to turn in bed. He was also at once ordered two grains of quinine and five grains of iodide of potassium, to be taken four times a day. He had, on a subsequent night, a second Dover's powder, and this was all the opiate taken during the illness. The opium, therefore, formed a very insignificant part of the treatment; and this I have found to be the case almost without exception.

The remedies to which I attach importance are:—

1. The vapour bath, and subsequent cold douche; and,
2. The combined quinine and iodine.

In this case the bath was given in bed, for the patient could neither turn in bed nor move his limbs; and it will generally be necessary to give it in bed, in the first instance, in any case deserving the name of rheumatic fever; and it is so easily administered, that no difficulty can arise to prevent its employment in every case.

Two large pieces of coarse flannel (common scouring-cloths answer the purpose admirably) are to be soaked in common vinegar; about a pint being

necessary for each cloth. Two common bricks are then to be heated nearly red-hot in the fire, folded up in these flannels, and placed on two plates. The patient being stripped, one plate is to be put a little distance from one knee, and the other a little distance from the opposite shoulder, and the patient is to be covered over with the bed-clothes. In a few minutes he is surrounded by a most refreshing steam-bath, which produces a warm, agreeable perspiration, that may be kept up for twenty minutes or longer, if the bricks retain their heat sufficiently.

As soon as it is decided to remove them, the patient, still in bed, is to be very rapidly mopped all over with towels wrung out of cold water, then immediately wiped dry with dry towels, supplied with a warm shirt or flannel garment, and covered with a fresh dry sheet, &c., or with blankets alone, as may be most agreeable to him.

The effects of this bath are a speedy relief of the acute pain, and frequently easy sleep for a time; an abatement of the offensive and distressing acid sweats; and a general state of greater comfort.

The cold water application immediately on the removal of the hot vapour is very important; as it prevents the continuance of an enfeebling perspiration after the hot bath.

The manner of removing the patient's bed garment is a point of importance in cases of such painful helplessness as rheumatic fever; and it is accomplished without pain to the patient or difficulty to the nurse by an extremely simple contrivance. The clothes must be torn down the back from top to bottom; and when this is done they can be removed and replaced as easily as a child's pinafore, without even lifting a limb of the patient or disturbing him in bed. By this means, fresh, clean, dry clothing can be applied without difficulty once or twice a day, according to the amount of sweating; and the sufferer is relieved from the discomfort of his damp, offensive garments.

This bath may be repeated twice a week; and during seventeen years that I have been in the habit of adopting it, I have scarcely ever had to use it a third time in bed; the patient, after the second bath, being almost invariably able to sit up and have the third in a chair.

When he is able to sit up, a steam-bath can be given with great ease by putting a bucket of boiling water under a chair, the seat of which is sufficiently protected to prevent the patient from being scalded, whilst he is sitting upon it surrounded by blankets; and, by putting a red-hot brick into the water in the course of ten minutes, the steam is kept up, as by this time it generally begins to abate from the original boiling water.

A jug of cold water may be poured over the patient when the blankets are removed, or he may be wiped by cold wet towels, as is most agreeable to his own fears or feelings, and he must then be clothed and sit up for a few hours.

The second part of the treatment upon which stress is laid, is the combination of moderate—*i. e.*, two grain doses of quinine with five grain doses of iodide of potassium from the first. The theoretical grounds on which quinine was first proposed have been already mentioned; and the general experience of the profession will suggest the explanation of the probable benefit to be looked for from the addition of the iodine.

We will now return to the history of the case.

After using the bath and taking the Dover's powder, he slept two hours, and was easier.

Second day of treatment.—Tongue rather dry. Two glasses of wine daily, in addition to his medicine.

Fourth day.—Sleeps moderately, and takes food moderately. Very uneasy from lying so long unable to turn in bed. Can move one arm a little. Repeat the vapour-bath, and continue quinine and iodide.

Next day—fifth.—Can sit up in bed, and move his arm so as to change his night-shirt in the ordinary way.

Seventh day.—Walked down stairs with a little help.

Tenth day.—Had a steam-bath in his chair.

Eleventh day.—Walked a mile and a quarter.

Twelfth day.—Went down to the office.

Sixteenth day.—Called upon me just before going to sea.

Such is an outline of the plan of treatment which I have practised habitually for the last seventeen years. During this time the cases have been numerous which have been thus treated; and the results have been so satisfactory, that I have always returned to this method, although I have given a fair trial to the alkaline and to the lemon-juice treatment. I have not tried the do-nothing method; nor have I ever relied upon opium alone; and bleeding and mercurials I have no experience of.

During this period I have only had occasion four times to apply a blister for heart-symptoms: and there has not been any instance of troublesome cardiac affection. What has become manifest on these four occasions has readily yielded to slight blistering, and a continuance of the quinine and iodine.

When the disease previous to admission has been of a more chronic or frequently repeated character than in the case above related, the improvement has not been so rapid as to amount to complete recovery in a fortnight; and where there is much gouty complication, the case will probably be more lingering. But, after endeavouring to ascertain without partiality what method of treatment is most beneficial to the patient suffering from rheumatic fever, I am increasingly impressed with the conviction that the plan now advocated possesses the advantage of—

1. Relieving the patient's suffering most speedily, both as regards pain, loss of rest, and sweating;

2. Of most quickly restoring the patient to strength, for it is extremly rare for him to be confined to bed more than a week, or to be confined to his room for more than a fortnight; and

3. Of securing extraordinary freedom from heart-complications, or liability to relapses.—*British Med. Journal, Sept.* 8, 1866, *p.* 273.

9.—HOW LONG DOES RHEUMATISM TAKE TO GET WELL OF ITSELF?

By Prof. Bennett, Edinburgh.

Who could venture to say that this or that treatment was or was not successful, if he did not know how long the disease was likely to last of itself? He had tried everything—there was no drug he had not tried—in rheumatism, and he found them all pretty much alike. He had tried nothing, and the result had been the same. He had tried the blanket, with the same result. They had given the alkaline treatment a most careful trial in Edinburgh, and it had seemed to him to have shortened the duration of the disease a little. In Edinburgh they saw a great deal of rheumatism in servant girls, on account of the system of washing adopted there. Girls got up very early in the morning to wash, and in all weathers, without care as to clothing, they alternated carelessly between the hot steaming kitchen in which the washing was done and the open air, often bitterly cold, where they hung the clothes to dry. He thought he had observed that where a strong young girl of this sort was seized with rheumatism, the acute symptoms had a tendency to disappear in about six or seven days; and if there was much complication, it would disappear in about 14 or 15 days. If the girl were weak, they found that murmur at the heart for which formerly violent remedies—mercury and so on—were given. Then, as, under the influence of rest and good diet, and warm comfortable treatment, the patient got stronger the murmur went away. In the old time, when mercury was given in these cases, it generally so happened that the murmur went away about the same time as the mercury touched the gums; and so it was concluded that the murmur went away in consequence of the mercury touching the gums. Now mercury was not given, and yet the murmur went away as soon. They had come to the conclusion in Edinburgh that, in one of the healthy cases he had named, if alkalies were used—they gave nitrate of potash—instead of being seven days, the average duration of the acute symptoms was six days and a half. He had given nitrate of potash regularly ever since coming to that conclusion. His view

was that acute rheumatism cured itself. Dr. Warren, of London, once said that six weeks in bed was the best cure for everything; and he had noticed that of Dr. Stewart's cases on the previous day, the average duration was forty-two days, which was very near six weeks.—*Medical Times and Gazette, Sept.* 1, 1866, *p.* 232.

10.—ON A NEW METHOD BY WHICH MALIGNANT TUMOURS MAY BE REMOVED WITH LITTLE PAIN OR CONSTITUTIONAL DISTURBANCE.

By Dr. W. H. Broadbent, London.

The attention of the author was directed to the treatment of cancer under the following circumstances:—In 1864 he was consulted by a lady suffering from cancer of the breast. By his advice the breast was removed by Mr. Walter Coulson. The disease returned, and was again removed in August, 1865. In May of the present year, a tumour was growing more rapidly than ever near the cicatrices of the former operations. It was decided that no further removal was advisable; and, unless something could be done, a miserable fate was before the patient. The hypodermic syringe is now in the hands of every physician; and it seemed to the author that by it some fluid might be injected into the tumour which might so far alter its structure and modify its nutrition that its growth might be retarded or arrested. After considering the various substances which presented themselves to his notice, he selected acetic acid, for the following reasons:—1. This acid does not coagulate albumen, and might therefore be expected to diffuse itself through the tumour; and the effects would not be localised at the point injected. 2. If it entered the circulation it could do no harm in any way. 3. Acetic acid rapidly dissolves the walls and modifies the nuclei of cells on the microscopic slide, and might be expected to do this when the cells were *in situ*. 4. It had been applied with advantage to common ulcerations. On May 18 the first injection was practised. The tumour was of about the size of a small egg, and a patch of skin of about the size of a shilling had become adherent to it. The needle was introduced through sound skin an inch or more from the part involved in the disease, and passed to the centre of the mass. About thirty minims of dilute acid (one part of acid to one and a half or two of water) were injected. It gave little or no pain. Next morning a bulla containing dark bloody fluid was found to occupy the patch of adherent skin. May 23: This portion of skin dry, hard, and horny; the adjacent part of the tumour not so hard. Again injected. The patient, residing in the country, was not again seen till June 7, when the piece of skin mentioned was found detached from the surrounding sound skin; and a probe could be passed in all directions to a distance of three quarters of an inch or more between the tumour and the healthy structures. A little discharge issued from the fissure mentioned. Injected on this date, and again on the ninth, the acid used being rather stronger. It gave a little pain, and swelling and tension of the parts around followed. On June 13, a few days afterwards, there was a free discharge of fluid and solid portions, with relief of the swelling, &c. No fœtor whatever attended this discharge, which afterwards diminished greatly. Seen again on June 26, when, on external examination, the tumour was found to be much smaller; and, on passing a probe into the opening, it entered a large cavity extending on all sides. Part of the walls seemed free from malignant structure, but at several points a crust of cancerous deposit remained. On attempting to inject, it was found too thin to retain the fluid, which either entered the tissues and gave great pain, or made its way into the cavity. The cavity was stuffed with lint saturated with dilute acid, and the case left in the care of the family medical attendant, who was to inject as he saw opportunity. July 13: No impression made on the remaining disease, which had, in the opinion of the medical man, extended somewhat. Carbolic acid was tried for a few days as an application, but discontinued, and the cavity dressed daily with strong acetic acid by the medical attendant, and injections

practised daily. This energetic treatment gave much pain, and excited inflammation all around. When again seen by the author on August 4, there had been considerable hemorrhage, which had been arrested by free application of tincture of sesquichloride of iron. The result, however, was apparently the entire removal of the remains of malignant disease; and when last seen, a healthy granulating surface was left at every point. Three other cases were related by the author. The author further formulated certain conclusions from the experiments detailed, and stated the cases to which, in his opinion, the treatment was not applicable. Guided by his experience, he considered large quantities of dilute acid preferable to stronger acid; and he would not, without great hesitation, attempt the destruction of any tumour which had not involved the skin. His aim had originally been, as stated in the early part of the paper, not necrosis of malignant tumours, but a modification in their nutrition. The theoretical grounds for this hope were, that cancer owed its malignancy to its cellular (to use a nomenclature now almost antiquated) or fœtal structure; and that in acetic acid we had an agent which might be expected to diffuse itself through the tumour and reach the cells, and, having reached them, to effect changes in their structure, and affect them vitally, while it could scarcely do harm. The results he had brought before the profession at the earliest possible moment. The ultimate value of the treatment he left to be decided by a more extended experience. It was important to use large quantities of dilute acid, and not to have the acid too strong.—*Medical Times and Gazette, Sept.* 1, 1866, *p.* 229.

DISEASES OF THE NERVOUS SYSTEM.

11.—ON SOME FUNCTIONAL DISEASES OF THE NERVOUS SYSTEM.

By Dr. Samuel Wilks, Physician to Guy's Hospital.

[Dr. Wilks considers that a more scientific classification of nervous diseases may be formed by connecting their phenomena with morbid changes in the nervous centres. He does not, however, suppose that we can expect to find a tangible change, discoverable in the post-mortem room, in every case in which nervous symptoms have been present during life. The present paper treats only of some functional disorders in which of course no organic change is discoverable. The nerve centres may be exalted or diminished in function, and these altered conditions may either be temporary and speedily recovered from, or followed by death in a direct or indirect manner.]

In women at the climacteric period we see the effect of lowering of the nervous influence in the fluttering of the heart, and the sickness, sighings, headache, &c. Probably no other invalids really feel so ill as these patients; the whole bodily functions are disturbed, and consequently a depression is experienced far exceeding that which accompanies any real organic disease. Such patients describe their feelings with the utmost despondency; they experience successive changes of temperature, which they style flushes of heat; they complain of anorexia, of flatulence, and of irritation of the bowels, uterus, or urinary organs. In fact, there is not a single viscus which does not suffer disturbance, so that every disease in the nosology may, in turn, be supposed to be present. Why one organ should suffer more than another, or why a morbid sensation should be experienced in this part of the body rather than in that, is probably to be explained by the anatomical distribution of the nerves; but we certainly find that, probably owing to the large supply of the sympathetic nerve in the abdomen, greater depression is experienced in abdominal than in other forms of disease, and that in all low conditions of the nervous system morbid sensations are very often referred to this region of the body. Thus, we cannot but contrast the cheerful disposition of the phthisical patient, when on the brink of the grave, with the depression observed in one who has but a temporary disturbance of his stomach, liver, or bowels; and

another indication of the same fact is the placing of the emotions in these parts, as expressed by the term "bowels of compassion."

Under the most varied conditions, both in men and women, when life is low, a number of morbid sensations arise. In a state of health man should be as happy and joyous as the lark flying in the heavens; he should have a keen sense of animal enjoyment, and he should feel nothing of the working of the machinery within him; but when his nervous system is depraved he becomes conscious of all these movements, he feels his heart beat, his head throb, and his back ache. A study of these nervous symptoms would probably show in what order they appear; I think that they commence, especially in women, with a pain in the left side, and that this is followed by pains on the top of the head, and in the back, at the epigastrium, over the collar-bones, &c. I feel uncertain whether these pains are altogether subjective or due to some prior alteration of function in the parts whence the pain proceeds. This question, however, is one of very great importance in practice; for we often find that, by attempting to relieve symptoms, we gain no headway towards overcoming disease, whilst by altogether disregarding them, and having recourse to a general tonic plan of treatment, we can ensure a cure within a certain period. At the same time it cannot be denied that the application of remedies to the spot to which the morbid sensation is attributed is frequently attended with success. Thus, plasters to the side, sedatives to the stomach, &c., do give relief. Relieving the local symptoms in this way is not, however, incompatible with a treatment directed to the restoration of the nerve centres themselves.

In practice, we have almost every hour of the day to endeavour to discover whether morbid sensations in and disturbances of the viscera are due to an organic cause or to the mere failure of the regulating power of the nerves; that is, whether the disease is organic or functional. In such cases the diagnosis is doubly difficult in females, because symptoms resembling those of almost every form of disease may be produced by their more delicate nervous organization.

We can imagine, by way of analogy, that in the case of a steam-engine working irregularly we might for a time be at a loss to discover whether the derangement was owing to some material deficiency in the valves or joints, or whether it was due simply to an irregular supply of steam. Or, again, we can picture to ourselves a clock perfect in all its parts moving too slowly, from the simple fact of the weight having nearly run down.

In the cerebro-spinal system, again, an exaltation or a depression of function is constantly witnessed. Such conditions are observed in chorea, in hysteria, and in various passions of the mind. Müller speaks of the nervous principle in the medulla oblongata as being in a state of tension and always ready to act, and he says that the slightest change in its condition excites a discharge of nervous influence, as is manifested in laughing, sneezing, &c. Thus every mental impulse to motion disturbs the balance of this tension and causes a discharge of nervous influence in a determinate direction. He also compares the nervous system to a musical organ, with its bellows charged and ready to force a stream of air in any direction, according to the particular key that may be touched. Using this illustration, we may imagine the air either to rush out with a scream, or to be hastily allowed to pass off by the larger tubes, or to be diffused melodiously through a series of musical pipes. In a similar way the superfluous nerve-force may display its operations in various ways, according to the sex, age, and temperament of the patient. For example I have seen the same cause produce hysterics in a mother and chorea in her child, the one disease being almost peculiar to the adult period of life, the other to childhood. The same fright which excited so great an amount of nerve-force in the mother as to cause the explosion known as hysterics operated on the child in a slower manner, and gave rise to the less violent action known as chorea. The spinal system was excited to over-action by the cineritious substance above, which had been unduly stimulated by a mental shock, and remained temporarily impaired until the disease was cured. The explosion of nerve-force by an hysterical attack acts as a kind of safety-valve,

protecting the internal machinery from danger; and although all are not alike impressionable, there is scarcely an individual who may not be in need of it when acted on by a sufficiently powerful stimulus. Even in the strong-minded Napoleon a fit is said to have been excited by passion. More commonly, however, relief to an over-excited nervous system is afforded by laughing or crying. Thus as Byron observes, the power which women possess, as compared with men, of being able to pour their troubles into their pocket-handkerchiefs, is no doubt often very beneficial to them, so far as their health is concerned. A woman who is excited, if she do not go into hysterics or have a good cry, often allows the redundant nerve-force to escape through that unruly member the tongue, and thus an extreme volubility of utterance perhaps saves her from further unpleasantness. Of course, the talk which flows from her lips is altogether different from the result of an intellectual process; and thus it is still true now as it was in ancient times, that "anger is a short madness." In Switzerland, last summer, I met an Irish gentleman, who told me that he could make his wants known without a knowledge of the language, but that when he was irritated and wanted to swear he would sometimes give all he possessed to understand German. In other cases, again, the superfluous force escapes by the limbs; thus an angry person slams the door, or destroys even her own property. A man of better sense, when vexed, takes a walk, and thus gets rid of his extra nerve-force; or, if the irritation and its results are more chronic, sits down, takes up his pen, and by publishing "the whole correspondence" eases his mind.—*Guy's Hospital Reports, Vol. XII.*, 1866, *p.* 247.

12.—ON HYSTERIA, OR GENERAL AND LOCAL NERVOUS IRRITATION.

By F. C. Skey, Esq., F. R. S., Consulting Surgeon to St. Bartholomew's Hospital.

In the whole range of practical Surgery there is, perhaps, no one subject that claims your earnest study more important than that which I have selected for this and the following lectures. It is not a question of diagnosis between two diseases more or less resembling each other. It is a question of disease or no disease, of reality or imitation, of true or false—of whether your purgatives, your bleedings, sweatings, irritants and counter-irritants, and your whole battery of antiphlogistics, shall be launched against a true disease in the flesh, or its ghost—whether you are to contend with a reality or a shadow. This absence of discrimination between two conditions of disease and no disease is painfully frequent among medical men, especially among those to whose charge is assigned the care of local and surgical diseases. "In one shape or another," observes the greatest of modern surgeons, "you will meet with them at every turn of your future practice." It may be asserted with truth that every part of the human body supplied with nerves, be they cerebral, spinal, or ganglionic, may become under provocation the seat of local symptoms so closely resembling those of the real disease to which that part of the body is liable, as to appear identical with it, and the resemblance to which is so perfect as to deceive the best of us. They are not cases of occasional or rare occurrence. They come before us in the daily and hourly walks of professional life. They monopolise a share, and not a small one, of all cases under treatment, whether medical or surgical, but the latter predominate. The closer you scrutinise them, the more penetrating your inquiry—looking into, and not at them—the more perfect will be your diagnosis, and the more you will be astonished that a form of disease so remarkable and so common should have hitherto occupied so little of your thoughts. It is well to call your attention to this description of malady at the early stage of your career. Many men pass through life, engaged in active warfare against disease, on whose convictions this variety has scarcely dawned. And this is a truly remarkable fact, which owes its existence to the predominating influence which the heart and the arterial system exercise over the judgment of

ion at the expense of a system yet higher in the scale of organiza-

tion, more sensitive, and more liable to morbid impressions—viz., the cerebro-spinal nervous system.

Whenever a new case of disease presents itself to us, we jump to the old doctrines of inflammation, we talk of congestion and of capillary action and of deposits of lymph, and we refer the attendant pain and heat to an inflammatory condition of which the local nervous derangement is an ordinary symptom. We should endeavour to assign to each system its proper place in the pathological scale, and to discriminate more accurately than is generally done the indications which belong to the morbid conditions of each, whether existing in combination or separately. For be assured they do exist, both separately and in combination with each other. You may have varieties of inflammation in which the local pain is trivial when compared with its severity in other cases; while, on the other hand, examples daily occur in which local as well as general derangement of the nerves, whether of the part or of the whole body, exists as a condition entirely independent of the vascular system. Nor is this derangement confined to the sensory nerves. If we have local pain as the indication of excessive activity of the nerves of sensation, we have spasm and convulsions indicating derangement of the nerves of motion, each of which, or both, may prevail without heat, or redness, or swelling. We daily see severe forms of nervous exacerbation without the slightest corresponding increase of action in the vascular system. There is this important difference between the morbid states of the vascular and nervous systems, that while local inflammations are dependent on local causes, aggravated only by the impaired condition of the general health, local nervous diseases for the most part originate in the centres of nervous power, the effects of which are exhibited in remote parts of the body—it may be in a pain localised in a given spot, whether on the surface or in deeply seated parts, which to our senses holds no especial relation to its nervous centre; it may be in a temporary, or spasmodic, or permanent contraction of the voluntary muscles bending the joints of the extremities in permanent flexion, or obliquely drawing the head upon the trunk, or involving the whole motor system, as in tetanus. No known nerve that conveys sensibility from its centre to its periphery—no motor nerve that carries volition from the brain or spinal cord to a voluntary muscle—is exempt from this morbid tendency.

The vascular system, consisting of arteries, capillaries, and veins, has its own special diseases peculiar to the structures engaged in the circulation of the blood. The attendant symptoms are heat, redness, pain, and swelling, the latter symptom being due to a separation from the capillary system of some constituents of the blood, whether in a fluid or solid form, while the morbid conditions of the nerves and the structures in which they originate are characterised by simple aggravation or excess of the functions of the nerves affected, the natural sensibility of the sensory nerves running into pain, and the moving power of motor nerves into convulsions, or spasm, or permanent contraction. In diseases of the vascular system we have changes of structure; in the latter not. It is necessary to make very clear the line which separates the two classes of disease, lest we fall into the common error of applying to both the remedial agents which are applicable to one only. The diseases originating in or involving the vascular system we treat locally by various agents—leeches, blisters, &c.; in diseases confined to the nervous system these local remedies are useless and even injurious, and we treat them through the constitution. In cases of tic do we derive benefit from leeches, or blisters, or from other form of depletive agents? Assuredly not.

Now the disease which forms the subject we have to consider belongs to the nervous and not to the vascular class; and I select from this variety that occasionally known under the term "Hysteria," than which no name can be more inappropriate or objectionable. It may well be doubted whether, except under very occasional circumstances, such a relation holds between the womb and this remarkable train of symptoms as to justify the employment of the term Hysteria. In the large majority of cases there is no connection between them beyond that which the disease holds with the other organs of the body. In the name of a disease we are supposed to recognise its form and

nature, whereas the term I have quoted conveys to the mind no distinct idea of either one or the other. And there is a positive objection to the resort to it in the fact that the word carries with it the association of a malady of small and insignificant dimensions, while the malady itself is of great magnitude. We associate with it the idea of "hysterics" and "vapours," as they were formerly called. I wish to raise your attention to the level of a great malady, and not of a trivial derangement of the hour. I remember a law case in which the counsel challenged a medical witness as to the name of the disease, and he replied, Hysteria. "Hysteria!" said the learned counsel, addressing the jury; "we all know what Hysteria means. My client has come into court to obtain compensation from a jury of his country for a permanent injury, by which all his prospects are blighted, &c., &c., and the gentleman in the witness-box, with no sympathy for his misfortune, proclaims the disease to be a case of trumpery hysterics!" and the jury, with rod in hand, let it fall heavily on the defendant's back. But there is a more solid objection than these, viz., that it is founded on a false pathology, in the employment of a term that conveys an impression of its source and nature founded in error. The disease consists in the local evidence of some irritation or derangement of one or the other of the nervous centres of the body, viz., the brain or the spinal cord—at least, such is the received pathology. But the subject is a very obscure one. We have no very definite idea of what we mean by "irritation." We all employ it, and so general is its use that I don't know how we can get on without it. "Irritation of the nervous centres" is a useful and not ill-sounding phrase, though somewhat mysterious, but it is no reflection on medical science that we can't explain all the phenomena of life; and as the term is somewhat wide in its application, and does not commit its employer to any very defined opinion on obscure matters, on which it is very difficult to form any opinion at all, I presume we shall retain it. One good reason that may be assigned for the persistent employment of the term Hysteria —a term we all know to be objectionable—is the difficulty of finding a substitute for it. We call the disease "local nervous irritation." It is "exalted nervous sensibility," but in naming a disease so definite as this we require a term equally pointed and definite with the thing itself. That we have not got. Sir B. Brodie says, "I employ the term Hysteria because it is in common use, but the etymology is calculated to lead to great misapprehension."

Failing the name, let us look at the thing, and if it be so critical as I have assured you, let us attach to it the grave importance its frequency and its magnitude demand.

It may be asserted with truth that every part of the body may become, under provocation, the seat of an apparent disease that in reality does not exist—that it may and often does assume all the attributes of reality with an exactness of imitation which nothing short of careful and accurate diagnosis can distinguish from the real disease. You think this impossible. Surely you know a diseased knee-joint when you see it. You find severe pain, aggravated by the slightest movement. The temperature of the joint may be raised, and it is slightly swelled. You leech, you blister, you employ an iodine liniment (few cases escape it), you may even resort to issues, but the evil remains in spite of all your remedies, which have been applied to the wrong "system." It is the nervous, not the vascular, that is involved, but the nervous has imitated the vascular and deluded you, and led to the employment of false remedies, which have failed to reduce the pain or give mobility to the joint, and the general influence of which on the health of the patient cannot be said to have proved eminently serviceable.

The case, on more perfect investigation, proves to be one of local nervous irritation, or Hysteria. You think you will not be again deceived, but you are mistaken. A single error, corrected by the experience of another, will not teach you hysteria. You are consulted by a lady in reference to a daughter of 18 or 20 years of age, who has exhibited failing health for some time and now complains of her inability to walk in consequence of a pain in her back. You examine her, and discover that she suffers extremely on pressure over two or three of the lower dorsal vertebræ, or on any other of the twenty-

four. You repeat the examination with the same result. and you make a report to the mother that her daughter has "spinal disease." The result of your opinion is two or more years' confinement to her couch, coupled with the usual allowance of restricted diet, alterative and other depletive medicines, leeches, blisters, and issues. Suppose these structures which you have declared to be the seat of organic disease to be examined under a microscope, what would you discover? Nothing. There is no disease whatever. As the nature of this malady dawns upon you, now awakening to a conviction of its frequency, you resolve to be more wary in your future diagnosis. You are now consulted by another young female patient on account of a tendency in one or more fingers to close in flexion. In the attempt to straighten them you cause intense pain, and if persisted in the consequences may be serious. Your patient appears in fair average health, and all her functions are regular and healthy; while the hand, for all ordinary purposes, is useless. Under the idea that she may have some chronic inflammation of the theca or of the palmar fascia, you treat it with the usual remedies. But your remedies produce no impression on the finger, which continues obstinately flexed as before; you adopt another principle of treatment founded upon a more correct diagnosis, and your patient recovers. These cases sound strange to your limited experience. You think they are rare, and brought forward from a distance and with an effort. By no means. They are cases of daily occurrence. If you could suddenly throw off that nebulous vision of vascular disease which years of bad pathology have impressed upon your judgment, you would see them in their true light. You may deem them to be exceptional. I assure you they constitute the rule of disease, and not the exception. *Real disease is the exception.* Speaking of one variety, and they have all characters in common, Sir B. Brodie, a man who rarely committed an error in diagnosis, says: "I do not hesitate to declare that, among the higher classes of society, at least four-fifths of the female patients who are commonly supposed to labour under diseases of the joints, labour under hysteria and nothing else." I would venture to enlarge this statement as regards the "upper classes," by including a large proportion of the lower; for much of my own experience of Hysteria has been obtained from the wards of St. Bartholomew's Hospital, and in reference to spinal affections in young persons, I unhesitatingly assert that real disease is not found in a greater proportion than one case in twenty, and even this is a liberal allotment Have you never experienced the difficulty of discovering an object floating in the air, such as a bird singing overhead, or an early star in the evening? When once the object becomes visible, the eye is readily adjusted to it, and when you look again in the right direction, it is the first object that strikes the eye.

And so with this class of diseases. They are not seen, because they are not looked for. If you will so focus your mental vision and endeavour to distinguish the minute texture of your cases, and look into and not at them, you will acknowledge the truth of the description, and you will adopt a sound principle of treatment that meets disease face to face with a direct instead of an oblique force, which far too generally claims the credit of a success for which nature alone is responsible.

I have selected above three varieties of this local hysteric affection. Let us consider them a little more in detail with a view to detect the fallacy which classes them under diseases of the first or vascular division, by which I mean an abnormal condition of the blood-vessels leading to changes of structure or altered relations, whether by suppuration, or ulceration, or fibrinous deposit, or local death of the tissues involved. In the first case the knee is the seat of pain. The subject is a young female. What evidence do we commonly look for when the joint is really diseased? We look first for a cause. Diseased joints don't occur without a palpable one, and particularly in young persons. There has been no violence, no fall or blow, to which to attribute it. Had there been, the nature of the disease is obvious enough. There is no considerable increase of heat, and if inflammation is present, perceptible increase of heat is constant. There is no effusion into the joint; the form

of the articulation is unchanged. The pain and the immobility or stiffness of the joint remain, notwithstanding your remedies. Local depletion relieves the pain of inflammation, but not of hysteria. But you persist in your principle, and the depletive treatment is continued, and thus months elapse—yes, even years. I was once told by a young lady that she had applied twenty-seven blisters to her knee-joint, from which she could not say she had derived any benefit. Now, it ought to be obvious that if a painful joint occurring in a young female without local cause is unaltered in form or size, and is free from heat or redness, and that the chief and almost the only symptom, that of pain, varies in degree at different times and is fluctuating in character, the disease is not of the inflammatory class; and if not it must be nervous, and you can't cure pain with leeches. You know that pain alone, which consists in an exalted nervous sensibility, does not constitute what we strictly understand by the term *disease*, although we apply it generally to any deviation from health, whether local or constitutional. At length the truth is brought home to you. You change your treatment by the substitution of local sedatives and general tonics, and your patient moves forward in the direction of recovery.

Take the second case. You have declared your opinion that this girl is the subject of disease of the spine upon the evidence of local pain produced by pressure of the fingers on the spinous processes of the vertebra. It has escaped your observation that this pain is equally severe whether pressure is slight or not, that in fact, the degree of pain indicated by either writhing or exclamation holds no relation to the force of the pressure made. The slightest touch creates as much suffering as the greatest pressure of the hand, and *often more*. It is on this evidence alone you have founded your opinion of disease of the bony structure of the spinal column. It is on this evidence you have consigned this young lady to two years' confinement to her couch, to the loss of education, to restricted social and domestic intercourse with her family and friends, and to much moral and physical suffering. Now when you talk of disease of the spine, what do you mean? What *structure* is diseased, and what form of disease is present? Is it seated in the body, or in the processes of the vertebræ, or in the entire bone? and what description of disease has invaded the particular vertebra of the twenty-four? Is it inflammation, or caries, or necrosis? Caries, you will say; and you select this form because, and only because, you know the spinal column is the subject of carious disease under conditions favouring it. But there is this remarkable feature in carious disease of bone well worthy of notice—viz., that it is almost destitute of pain, that there exists no relation between the extent of the disease, which may be great, and the pain attendant on it. It is not like inflammation of bone, whether simple or severe, or necrosis. Presuming this statement true, can you in reason feel satisfied with the evidence of disease obtained by manual pressure? Then, again, where is the disease situated? If in the body of the vertebra, is it not almost absurd to suppose you can detect it by the slight pressure of the finger *on the summit of the spinous processes*, which are themselves rarely involved.

Fifty or sixty years ago a provincial surgeon of some note recommended the application of a hot sponge to the spine, with a view to detect disease of the bodies of the vertebræ. There was some excuse for ignorance on this subject at that time; there is none now. Of all the fallacies that cling to professional practice, of all the false doctrines which the pardonable ignorance of a former generation has entailed on modern surgery, none can surpass that which affects to detect carious disease of the body of a vertebra by drawing the fingers down the spine. It is only not ludicrous because the consequences are so serious to the victim. It would be a bold assertion that such morbid changes in the spinal column cannot occur; but I do think humanity would be a gainer if all teachers concurred in asserting that they *could not*, so rare is the real disease, and so palpable to the eye when present. Suppose a young person in moderately good health, and occupied in daily exercise, complained of a pain in the condyle of the femur, without any other indication, should you be warranted in declaring she had serious disease of

the bone? Look to the functions of this important column; how is it possible it can support the body in the upright posture if one or more of the component bones of the pillar are destroyed? And yet I have known many examples in which the subject of this imaginary disease has joined a party and danced for the whole evening. One wonders that such a person did not drop into pieces. For myself, I candidly declare that I have scarcely ever seen a case of true disease of this form. I can bear testimony to spinal affections and destruction of bone to any amount in psoas or lumbar abscess, or in angular curvature, or of damage done to the column by local injury; but to these suppositious cases, which exist only in the brain of the surgeon, I am a stranger, and if they exist otherwise than as rare examples of spinal disease I have much to learn. Have you ever seen a person recover from actual disease of the spine? I do not mean to infer that death inevitably follows, though that result is by no means uncommon; but I allude to recovery without some distortion or some permanent evidence of past disease. And yet you may be surprised when I assure you that all these young people recover sooner or later—sooner if the surgeon in attendance is familiar with hysteric affections, later if he is not. Thirty or forty years since these cases were, happily for our time, far more common than at present. At that date and for how many years anterior I know not, all the sea-side towns were crowded with young ladies between 17 and 25 years of age and beyond it who were confined to the horizontal posture, and were wheeled about on the shore in Bath chairs, on the supposition that they were the subjects of spinal disease. They were placed under much medical and dietetic discipline, not of the most invigorating character, and the large majority carried a pair of handsome issues in the back! Brighton, Worthing, Hastings, and other places on the south coast were tenanted largely by these unfortunate females, to which a moderate sprinkling of young gentlemen was added. What has become of all these cases? They appear to have vanished just in proportion as the eyes of the surgeon have opened to the absurdity of inferring that pain alone which locates itself with remarkable precision in hysteria on a given vertebra can indicate the presence of organic disease of the body of the bone without collateral evidence in its favour. When the spinal column is really diseased the case is obvious at a glance; the health is degenerate, and the whole system proclaims to the eye of the surgeon the presence of a great evil. These examples are but a miserable mockery of the reality and a fraud on the judgment of the ignorant.

With regard to the third example, that of permanent flexion of the fingers, it is apparently so truly local an affection that there is some excuse for error, but only because hysteric affections are not half studied. When one or more of the fingers is permanently flexed from local causes, the seat of the disease will be found in the fascial structures of the hand or in the finger itself, or a joint may have been diseased or dislocated; but here there is no thickening, nor hardness, or other morbid change of structure. The finger is simply bent, and the attempt to straighten it is painful. The cause of this morbid condition of the flexor muscle is referred to its nervous centre placed in the cervical portion of the spinal cord.

It is not an easy task to select the class of constitutions most liable to hysteric diseases. Probably under certain conditions of impaired health the large proportion of the community would give evidence of its presence. Certainly it is uncommon in the lower class of males, and among those who occupy the beds in our public hospitals. We know, on the other hand, that it is most prevalent in the young female members of the higher and middle classes, of such as live a life of ease and luxury, those who have limited responsibilities in life, of no compelled occupation, and who have both time and inclination to indulge in the world's pleasures—persons easily excited to mental emotion, of sensitive feeling, often delicate and refined. Such are among the mental attributes of hysteria. But hysteric diseases are not confined to the young. I have seen many examples in females of 40 to 50. Do not imagine hysteria is a disease of persons of weak minds. It will often select for its victim a female member of a family exhibiting more than usual

force and decision of character, of strong resolution, fearless of danger, bold riders, having plenty of what is termed *nerve*. If you tell such young people they are nervous, they take offence, because they misinterpret the meaning of the word, and so may you. And they may well misinterpret it, for, like the word "irritation," its popular meaning is both various and indefinite. It is essential that we attach a definite idea to this term in its different applications, and I must digress for a moment to endeavour to explain them.

I have already used it in one sense.

1st. The word nerve is used to express the mental condition of vigour, boldness, and resolution—as when a man's nerves are strung up to meet danger; so ladies are said to ride with more or less "nerve."

2. We employ it in its physical sense as a part of the general system of the nerves of the body.

3. We have the terms "nervous system," which may be not inappropriately defined as holding the same relation to the "system of nerves" in its physical sense that the physiology of a part holds to its anatomy. Yet this definition is imperfect, because the properties of the nerves of the cerebro-spinal system, with the small exception of those of specific sensibility, such as sight, smell, taste, &c., begin and end in the functions of motion and sensation. By the term "nervous system" we understand the general influence which the nerves in a physical sense exert on the constitution, the healthy or tonic condition of which is in a ratio with the combined force of the two systems—viz., the arterial, or circulation of blood, and the nervous. Health depends on the coincidence of these systems in perfect action. If the circulation fails in power, the consequence of this weakness falls on the nervous system, which is dependent on the circulation for its health and vigour. Failing an adequate supply of blood, this system is unstrung, and morbid sensations, endless in variety, take the place of real; and of all consequences hysteria is the most common. In the deficient supply of blood to the brain the faculties of the mind are involved. Confidence of strength gives place to fear, mental vigour to weakness and irresolution. Such indications as are untrue to the real character of the individual as the physical sensations are false and deceptive. Such is the nature of the large proportion of cases of persons who come into courts of law for compensation for what are erroneously deemed permanent injury, bringing with them headaches, spinal pains, tingling of the extremities, impaired vision, loss of memory, and many other symptoms of an unstrung nervous system—a series of grievances of the incurable nature of which an acute lawyer takes care to provide himself with ample testimony, and which will always be obtained so long as the diseases of the vascular system and their consequences monopolise a too prominent share of the attention of our profession. I have traced several of these persons in their after career, the large majority of whom entirely recover. I believe it is to the prevalence of error in the early management of these persons, who are almost invariably subjected to depletive treatment, and to the imperfect knowledge of nervous diseases which prevails in the profession, that large sums are awarded for injuries erroneously supposed to be permanent and incurable. Can it be reasonably expected that the truth will be brought home to the mind of a lawyer so long as our own opinions are yet uninstructed upon it? Sooner or later their true nature will become established facts in the minds of our profession, and we shall no longer hear the painful discrepancies of opinion among medical men that now prevail. The light of improved knowledge will dissolve the daily mysteries which surround these cases in the form of supposed spinal concussions, partial paralysis, effusions into the theca vertebralis, thickening of the membranes of the brain, spinal cord, and lesions of this organ or that. These, as Dr. Sydenham declares, are but imitations and resemblances, and not realities, and that they deceive the multitude is undoubted. When real disease prevails there is no difference of opinion among medical men as to its existence.

It is a very interesting question, to investigate how far the functions of the mind are involved in hysteric disease, and how closely it is connected with it, whether the relation between them is direct and immediate, or remote. In

cases of local pain, and also the local contraction of muscles, arising either from an excessive action of one muscle, or from the loss of harmony of action with its antagonist, as in a permanently flexed forearm or finger, it seems difficult to identify the evil with that part of the brain which we believe to be the seat of mind. And yet an inquiry into the past history of such persons will often reveal the fact that they have been at one time or other the subjects of general or paroxysmal hysteria, or, in other words, that they have had hysteric fits; and as mental emotion is more or less associated with this form of hysteria, it would appear not unreasonable to infer some remote relation between the mind and this variety of a disease apparently simply local in its nature. There is something in the mental development of these young persons very characteristic. They are quick and excitable, liable to sudden emotion without adequate cause. In very young persons the local disease may be developed before the mental character is fully matured, but advancing years will exhibit its peculiar features.

It is curious to observe the influence which the nervous system exerts on the daily condition of us all. When unstrung it preys upon ourselves. It is not in the varying force in our pulse, for that gauge is not sufficiently fine to detect the variations of health, that we can refer a consciousness of strength and vigour on one day that fails us on another. It is that our nervous system is more or less unstrung. There is a real illness and a factitious illness, and in this we observe the remarkable influence of mind in exercising a controlling power over the body. People without compulsory occupation, who lead a life of both bodily and mental inactivity—people whose means are sufficiently ample to indulge in, and who can purchase the luxury of illness, the daily visit of the physician, and, not the least, the sympathy of friends—these real comforts come home to the hearts of those ornamental members of society who are living examples of an intense sensibility, either morbid or genuine, who can afford to be ill, and will not make the effort to be well. They are, in truth, well or ill, as you choose to take it, and they are only ill because they fail in mental effort, that mental resolution which is sufficiently powerful to rouse the dormant energies of the body and throw off the sensations of lassitude, of unreal fatigue and weariness of body and mind. A poor man cannot afford this indulgence, and so he throws the sensations aside by mental resolution.

There is a real fatigue and a nervous or unreal fatigue. A lady will tell you she was so tired that she could not walk another step. She thinks so, and without an adequate motive she cannot make the required effort. Give her the motive, such as the sudden illness of a relative or friend at a distance, and she will extend her walk to miles without effort or subsequent fatigue. How is this? It is that by a great motive acting through her mind she has called upon those dormant powers of her system which are possessed by all of us to be employed on critical occasions. Rarely, if ever, is the body subject to a degree of fatigue so great that an adequate motive will not obtain renewed exertion. When a lady tells you she can only venture on a walk of half a mile, you will understand that this effort is determined, by the ordinary, not the extraordinary motive. It is your duty as her medical attendant to place before her such inducements to a greater effort as shall call on the exercise of her dormant power, *the reserved fund* of physical strength, and she will walk four times the distance without fatigue. A poor man runs a race against time, and reaching the goal he drops from fatigue. Offer him at the moment £100 if he will run one hundred yards farther. He will accept the offer, run the required distance, and then drop. This is resolution acting on his muscular powers through his nervous system, screwed up by an extraordinary mental effort.

And this law of Nature is applicable to us all in our daily intercourse with the world. A man resolves to accomplish a certain amount of work on a given day, and he completes the task he has assigned himself by virtue of his resolution. Such resolution is eminently protective against fatigue.

A question arises to one's mind—Is Hysteria what is termed a specific disease, or is it the invariable result of a condition of health into which all

persons pass in reduced states of bodily vigour, but only modified in degree? I presume it is associated with a peculiar organism common to man but not involving all, as some persons amenable to the influence of mesmerism pass readily into profound sleep, while others are entirely unaffected by it. It notoriously is far more common in women than in men, and in young persons from the age of 17 to 30, in the unmarried than in the married. We do not associate hysteric affections with persons of either sex who are characterized by vigour of mind, of strong will, of strength and firmness of character. Such persons may be reduced by protracted illness to a condition of weakness both bodily and mental, but they do not in their reduced strength, so far as I know, exhibit any of the peculiar features of hysteric affections. There is a remarkable form of hysteria which affords evidence on this subject. It is notorious that the sight of a person under an hysteric attack has a tendency to involve other hysteric persons around her. It has happened to me several times in my hospital career to witness the contagious, or rather the imitative, form of active or paroxysmal hysteria on a large scale. On one of these occasions, in a ward of 12 females, no less than 9 young women were affected at the same time. Several were so violent as to call for the assistance of sisters, nurses, and other servants of the establishment to restrain them; and inasmuch as a person under the influence of hysteria brings into action all the latent strength of her muscular frame, which is greatly in excess of her apparent strength, the services of these attendants were scarcely sufficient for the purpose—several requiring three or four strong men to prevent injury to their persons. The attack commences in the person of one girl, who may have been the subject of some trivial operation, or been brought under the immediate influence of the disease by mental emotion. No sooner is the condition of this patient observed by her fellow-patients than her influence is felt throughout the ward, and the second subject may become involved, occupying a bed at the remote end of the room, and thus it passes irregularly from bed to bed, each patient appearing to take the disease in the order of their constitutional liability. In the course of an hour, more or less, it subsides, and tranquillity is restored, but the evil only slumbers, and on the following day the same scene may recur—less violent, perhaps, but acted by the same persons as at first. Some of these patients, who were not affected to violence, were affected to tears and wept in silence, while some few were not implicated at all, nor did they show any tendency to sympathise with the disease. These curious attacks, though they appear to the subjects of them irresistible, are yet but the result of what has been termed a surrender, and might be prevented by an adequate motive. The mode adopted to arrest this curious malady consists in bringing these persons under the influence of some powerful mental emotion, and in making some strong and sudden impression on the mind through the medium of, probably, the most potent of all impressions, fear. They are not lost to consciousness, and for the moment, except in the intensity of their paroxysm, they will listen to the voice of authority. Sympathy and kindness, or tenderness of voice and manner, are worse than useless. They rather aggravate than mitigate the evil. Ridicule, to a woman of sensitive mind, is a powerful weapon, and will achieve something, but there is no emotion equal to fear, and a threat of personal chastisement will not necessarily be required to be carried into execution. On two of the occasions I have referred to, a few quarts of cold water suddenly thrown on the person of a chief delinquent instantly brought the ward to a state of reason and tranquillity. The disease succumbed to the indignity of the treatment. There can be no doubt, then, that a malady spreading by sympathy and cured by fear, has its origin in the mind. I think you will find on close inquiry that nearly all cases of paroxysmal hysteria originate in some form of mental excitement, and that of a depressing character, such as sorrow or disappointment. It is not the result of mere emotion. Joy, gladness of heart, or a sense of pleasure rarely produce it; yet it is difficult to explain either its immediate or proximate origin in attacks occurring during sleep. Sometimes these patients suddenly awake from sleep with severe palpitations of the heart leading on to a direct attack. What can be their

immediate cause? There is no disease of the agents of circulation, or any suspected variation in the quantity of blood thrown upon the heart by which to explain it. Whence, then, the eccentric action of this organ? Possibly some mental emotion in the form of a forgotten dream or some other occult mental operation which escapes cognisance, such as occurs in cases of somnambulism.

In these current remarks on general hysteria we must not lose sight of the subject taken in a surgical point of view. I have stated, both in this and in the last lecture, that under the condition of impaired health, the nerves of a part of the body may become the subject of a deranged action by which, as Dr. Sydenham has declared, and we in our generation almost daily observe, so many symptoms of actual disease of that part may appear as to give the exact appearance or versimilitude of local organic change of structure when such disease is entirely absent. There may be nothing apparent on a first inquiry to associate the case with hysteria, whether local or general. It is not necessarily nor commonly preceded by hysteric paroxysms. There may be no appearance of illness, no heat or undue excitement of the system, nothing, in fact, to connect it with hysteric disease; yet it is nothing but local nervous exacerbation, and from the want of a better name we call it hysteria. You must not confound it with simple neuralgia; and with still less reason, with epilepsy. It is not, however, always easy to draw a distinct line between neuralgia and hysteria, for both may have a constitutional origin, and be amenable to nearly the same treatment. In neuralgia, however, we have a more generally local and more persistent affection of a nerve. The disease appears to be limited to the nerve itself, the course of which may be traced by the pain, which is often excessive; whereas in those cases of hysteria marked by local pain, the pain is general, involving the structures around in common with real disease of the part affected. In neuralgia the disease is placed on a recognised nerve, and a person is said to have neuralgia of a given nerve, such as the frontal, mental, or digital. In hysteria any locality may be affected without reference to the distribution of nerves; while epilepsy is characterised by well-marked symptoms clearly of a cerebral origin. If you amputate a limb for hysteric pain, you throw the disease back on its nervous centre, and you kill your patient. In the early part of my hospital career I have seen this fact more than once exemplified. In such cases operative surgery is entirely out of place.

Now, before I proceed to illustrate these statements by reference to cases, of which I have an ample supply, I wish to make a few remarks on the relation between local hysteria and the nervous centres—viz., the brain and spinal cord. Any facts that tend to throw even a gleam of light on the connexion between them must be interesting. I refer to the influence of anæsthetic agents, especially of opium and chloroform. In cases of hysteria marked by local pain, relief is given by the application of opium to the affected part—a fact which does not confirm the generally entertained opinion that the local affection is dependent on irritation of the nervous centre. Select a case of hysteric contraction of the muscles of a joint—the elbow or fingers. If you administer chloroform, the contraction of the muscles which may have existed for months, and which has resisted repeated attempts to extend them, will now yield to a gentle effort of extension, and the limb is immediately restored to apparent repose. Supposing this morbid contraction of one or more muscles to be caused, as we believe, by irritation of the nervous centre, how does opium or chloroform affect it? The effects of chloroform on the circulation are assuredly not in the direction of health, for it converts arterial into venous blood, or, at least, it gives to arterial blood the dark color of venous, and we can hardly believe impaired circulation of a part of the body compatible with its improved function; and yet the disease subsides. This "irritation of the nervous centre," as I told you, does not convey a very clear idea of the nature of the relation between the respective parts—viz., the seat of the disease, and its source or centre. Perhaps the nearest approach we can make to a solution of the difficulty is by saying that these two agents—opium and chloroform—suspend for the time the influence of both sensory

and motor nerves, under which suspension the local pain or the erring muscle partakes of the general influence of the anæsthetic. To bring this morbid state of the muscle within the influence of the mind as its cause is almost of necessity to infer the local evil to be wilful; but if it were so, the state of unconsciousness during sleep would remove it, which it does not, for the contraction is constant by night and day, while the specific influence of the chloroform suspends the disease, if it does not cure it, and the renewed, though partial, contraction of the muscle is now prevented by mechanical agency. The remarkable circumstance consists in this, that a disease of long standing which incapacitates for exercise and occupation is removed in a few minutes by the agency of chloroform, and the patient placed at once on the high road to recovery. Is this curious fact confirmatory or otherwise of the origin of the disease in the nervous centre?

Unfortunately hysteric persons have no exemption from real disease, and when the two are found in combination a difficulty in diagnosis will frequently occur to test the pathological knowledge of the surgeon. The local disease is accompanied by symptoms of an eccentric character that do not legitimately belong to it. Local pains are aggravated in the active stages, and do not subside in a degree proportionate to the local improvement. A small malady such as a sprained wrist or ankle, is magnified into a large one. The constitutional symptoms take the direction of hysteria instead of fever. The vascular system indicated by the state of the pulse, the skin, &c., is less involved than the nervous, and months will often expire before recovery is complete. To a surgeon not familiar with hysteric disease, who practices his profession with reference to one only of the two systems of which the body is composed, these cases will always be obscure and difficult of management. When an injury occurs to the person of a young female, and to many others neither young nor female, hysteric symptoms are almost certain to develope themselves in some form or degree before recovery is complete.

[It is an indisputable fact that any part of the body can be the seat of such local derangement, either of the nerves of sensation or motion, as shall actually represent disease in that part, when no disease, properly so called, exists.]

Cases of real hysteria may be reckoned by hundreds in the practice of any one surgeon. The more common seats are the female breast, the side of the trunk under the ribs, the whole spinal region from the atlas to the sacrum; any joint, but especially the knee; the stomach, the bladder, and the ovaries; the muscular system of the extremities, indicated by spasm or permanent contraction; and the muscles of the larynx. But no part of the frame has exemption from liability, so far as I am aware.

I will first quote a very simple case of hysteria, the evidence of which is immediate and the attack transient. In some slight forms the patient loses all command over the voice, which suddenly sinks to an almost inaudible whisper, without any other accompanying symptom. I have seen many examples, but that I give occurred under my own observation, as it has probably in some form occurred under that of others, for it is as old as history. The subject was a young lady of about 20, as Sir B. Brodie observes, of pale complexion, and having cold hands and feet. While I was engaged in conversation relative to her health, I somewhat imprudently remarked that a mouse was running about under the table at the end of the room. She uttered an exclamation of alarm, and in an instant so entirely lost the power of audible speech that I was obliged to approach her and to put my ear close, to hear her. The ferocious cause of the mischief having paid the penalty of its intrusion by the loss of all it possessed on earth, the lady in the course of an hour recovered her voice. Had this person been in sound and vigorous health, she would probably have sustained the shock to her nervous system with less derangement of it. The case is interesting as showing the sudden influence of the mind on a particular nerve in the general system. Ammonia, chloric ether, henbane, &c., quickly administered, would probably shorten the attack, and for which agents brandy is a good substitute.

Cases of hysteric affections of the breast occur in young persons from 16

to 20. They are associated with a disturbed condition of the genital system, but not especially with the functions of the uterus itself. Although the catamenia is often deranged and defective, it is not necessarily so. The general system is at fault, indicated by a low circulation—frequently a chlorotic aspect, failing appetite, languor, and indisposition to any form of active bodily or mental effort. In the cases I have seen, the breast has been small and soft. The disease consists of simple pain in the organ, one or both, but more severe in one than the other. It is most active at the catamenial periods. The breast is unaltered in form and substance. The evidence of local inflammation is entirely absent. Leeches, or other forms of local depletion, give no relief. Blisters and irritating plasters and ointments answer no useful purpose. The degree of pain varies with the condition of the health. For a period it may almost cease—a period co-existent with a change of air and occupation, or a residence of a month or two at the seaside, but the pain relapses on the return of the subject to the ordinary habits of life. The pain is dull and aching, and very unlike the smarting and shooting pain which accompanies abscess or the more formidable diseases.

With this history who will doubt the constitutional nature of the malady or the efficacy of such remedies as tend to change weakness for strength, to promote appetite, to keep the circulation in action by frequent exercise, taken at least twice daily?

Of examples of hysteric pain situated under the ribs, more commonly on the left side, it is needless to quote individual cases—they are so common. From some cause not very apparent, they are, however, seen less frequently than formerly. I attended, some years ago, a young married lady, the mother of three or four children, the daughter of a medical man of large experience, by whose direction she had been cupped about fifteen times over the seat of pain. The malady prevailed in her system in its active form during many years, and she was not free from it when I saw her at the age of 30. This treatment, which included the local application of leeches by the hundred, and blisters, the sum of which might be calculated by the square yard, while it gave no permanent relief, has left its mark in more senses than one on the person and constitution of this lady for life. At all events, her excellent parent has the merit of perseverance, if not of discrimination.

Among the cases of sympathetic or imitative forms of hysteria which I have already quoted, two of these females exhibited the scars of similar local treatment for supposed organic disease under the ribs, and I have seen many others. I need hardly tell you that this is a constitutional and not a local infirmity, and must be treated accordingly, *or not treated at all.* What structure or organ occupying this region on the left side, under the lower ribs, can be supposed the seat of this pain? It is deep-seated, and therefore the abdominal muscles are beyond suspicion. Is it the colon, or the spleen, or the base of the left lung, or the diaphragm? Whichever structure is involved, if any, rely upon it the essence of the malady is seated in the nerves, and the nerves only. If it were organic disease, its nature would become in time palpable. There is this important distinction between the two affections—that organic disease has a crisis, and nervous affections for the most part have none.

Spinal hysteric affections are, perhaps, of all hysteric maladies of the most common occurrence—happily they are becoming somewhat notorious. It is in the records of pathology, no doubt, that a young female may become the subject of real spinal disease; but where are the cases to be found? You may pass through life and not see two. And while I state this opinion your minds may possibly revert to some case you have already attended which you think exceptional. Look more closely into it, and you will detect your error. In forming an opinion on any given case on which you may be consulted hereafter, you had better make a starting-point from the knowledge of this fact, that nothing in pathology is more improbable than that a young lady should be the subject of organic disease of the spinal column. Well, a case presents itself for your opinion. A young female, in any class of life, in apparent health, pale or florid in complexion, bearing in her appearance

no indication of disease, complains of pain in the back. This pain may be announced without surgical inquiry, or may be detected only on examination. The spine is exposed while the person is placed in bed. Pressure is made by one or more fingers on the spinous processes of the vertebræ, beginning with the atlas. On reaching perhaps the last dorsal or first or second lumbar vertebra, the girl utters an exclamation of pain, and she instantly shrinks from the pressure. The examination is renewed again and again with the same result. Twenty-three vertebræ admit of pressure through their final processes without causing suffering. Pressure on the particular one, or perhaps two, causes instant and often severe pain. Who ever heard of real disease attacking one or even two vertebræ only?

I have already told you the probable result of this inquiry, but you, I trust, will not be deluded. Be assured to the extent almost of certainty that there is no organic disease, either of bone or of any other texture. I attended a girl in St. Bartholomew's Hospital of about 20 years of age. She had the appearance of a strong and healthy person, and there was nothing in her aspect to indicate that she was the subject of disease. Before I reached her bedside the house surgeon informed me she was the subject of "spinal disease," and I smiled at his credulity. To the students around I said: "If on examining this girl she makes an exclamation of pain and shrinks from the pressure of my hand, rely on it she has no disease whatever, and that her case is one of simple hysteria." On reaching the first and second lumbar vertebræ she uttered an expression of severe pain, and nearly threw herself out of bed. The diagnosis was confirmed, and she was treated for a nervous and not a real disease. Extract of opium dissolved in soap liniment was rubbed on the spine for a few days, and then the opium was omitted, and the back generally rubbed by the hand twice daily with some force of pressure. She was ordered valerian, bark, iron, and a full diet, with wine. Her recovery occupied one month.

I was consulted in the year 1862 on the case of a young lady of about 24 years of age. She had had "spinal disease" for several years, and many surgeons of more or less eminence had been consulted on her "very remarkable case." Her aspect was that of a healthy person. She was inclined to be stout, and exhibited no indication of serious disease, or indeed of disease of any kind. During five years her back had been most liberally cupped, leeched, blistered, and embrocated without benefit. I was informed that the pain had occasionally intermitted, that her condition had improved for a time and then relapsed, and that although nearly the entire five years had been passed in her chamber and in the horizontal posture, yet that occasionally she would join her family and seek relief from the monotony of her life in the gaiety of the ball-room, where she forgot her diseased spine and all its attendant miseries, and danced for hours with life and animation. I examined her back with more than usual care. The pain, always true to its own locality, occupied the second lumbar vertebra, and always returned on the pressure of my finger on that particular spot. Occupying her attention by conversation, I gradually subjected the whole back first to gentle, and then to severe, pressure. With both hands I grasped the trunk, and moved it forcibly in all directions without creating any sensation of pain. I then passed the flat of my hand rapidly down the spine, employing not pointed, but obtuse pressure over the whole surface, and thus satisfied myself that there was no disease. After the interval of a few minutes, pointed pressure on the second lumbar vertebra produced the same symptoms as at first. On examining the surface I observed the mark of a cicatrix of about three inches in length running along the side of the affected vertebra, and on inquiry I learnt that one surgeon whom the family had consulted had deemed it necessary to look within and below the surface, under the supposition that there might possibly be a tumour or some morbid growth, the removal of which would be conducive to her recovery! Nothing, however, was found, and the excision of a small portion, I presume of the erector spinæ muscle, afforded no permanent relief—at least no benefit had arisen from the operation at the expiration of many months, when I was requested to see her. It struck me that

this was carrying the experiment of operative surgery rather far, but I did not make any remark to that effect at the time. I certainly made an inquiry as to the product of the operation, and the father of the young lady told me that he was shown something, but he was not competent to state exactly what it was. On discussing the nature of the case with the family and the attending surgeon, I expressed my conviction of the hysteric nature of the disease, and that she was capable of exertion could she be induced to attempt it. I saw at once that I had failed to convey my own convictions to the family, that my opinion was not satisfactory, and that in the judgment of the lady's father, a very sensible person, the opinion of one man could not outweigh that of many, and that the testimony of the many was the safer guide. The patient returned to her couch, on which she may be now reposing for ought I know to the contrary, for I saw her but once. I had, however, the satisfaction to hear the medical man say as I left the house, "I believe your view of the case is the only true one."

As treatment by means of issues was formerly in great resort, and is yet far from being abandoned as a means of checking the progress of carious disease in the vertebræ, it is worth considering for a moment the principle of its action. To control one disease you make another, which is supposed to act as a drain in carrying off the morbid actions of the original disease by derivation, or counter-irritation as it is termed. An issue is an ulcer, secreting matter, and drawing more or less on the powers of the constitution. An ulcer is a disease. All disease exercises a depressing, not an invigorating, influence on the system. The sum total, then, is increase, not diminution, of the evil. The morbid condition of true spinal affections is *caries* or crumbling of bone, not inflammation. Is it probable that a pair of secreting ulcers can tend to restore bone that is lost? Will the capillaries be more likely to secrete material to be converted into healthy bone within the body because you have made an ulcer outside? The actions going on within are those of deficiency, and not of excess. Here comes in again the old doctrine of inflammation. The operation of an issue is equivalent to that of the lancet, and in these days that instrument has become obsolete in the hands of all sensible and thinking men. I acknowledge with all regret, in looking back at the early part of my own professional career, to have frequently committed this error in treatment, and I willingly make retribution to another generation by declaring my conviction of the entire futility of an issue in this description of disease to answer any useful purpose.

While on a visit at the house of a friend in the country, I was requested to see one of his daughters who had been confined to her room for fifteen months in consequence, as I was told, of diseased spine. She was 21 years of age. Her countenance was pale, but not unhealthy. She had been condemned by a court of surgeons to a long confinement to the horizontal position, and she bore the judgment against her with resignation and humility. From the appliances around her, and the general arrangements of the room, it was obvious that the siege was to be long and vigorously maintained. My visit was not a professional one, and I did not propose to myself at the time to discuss the subject of her disease. Accident brought me into contact with her medical attendant, and in the course of conversation with him some features of her case were mentioned, which appeared not very consistent with real disease of the vertebræ. We examined her carefully, and the consultation which ensued terminated in the proposal that his patient should change the horizontal posture for that of an inclined plane. In a week she sat upright in an easy chair, and within a month she joined the family circle, entered into all their pursuits, and could ride any reasonable distance on horseback without fatigue.

I see no advantage in multiplying these painful examples of hysteric disease. They have all general characters in common, and are amenable to the same principles of treatment. And so with cases of supposed injury from railway accidents. Again and again have I heard medical men, physicians, surgeons, and general practitioners come into courts of law and state their opinion that the plaintiff had sustained grievous and probably permanent

bodily detriment to the spinal column, on the evidence of pain produced by pressure of the finger on one or more of the spinous processes—evidence far more than counterbalanced by the fact that these deluded persons have walked unaided into court, and have stood or sat in the witness-box for three-quarters of an hour while under examination.

No evidence of their reputed symptoms is obtainable either through the eye or the touch of the surgeon. There is nothing palpable, nothing organic. You take the assertions of your patient on trust, you identify yourself with his case; you place an object before him, and he declares he cannot see it; you refer to an occurrence that happened last week, he declares he does not remember it. He suffers incessant pain in his back; he staggers in his walk, occasionally coming to a harmless fall; he has convulsive twitchings in his leg, occurring chiefly in bed, which he says he cannot control. He passes blood in his urine, which always escapes the notice of others, for it is invariably passed at the water-closet, and at no other time; but on inquiry you will find that this afflicted person can walk four or five miles; that as regards his vision his iris acts well, and the ophthalmoscope detects nothing; his appetite for food is sufficient for perfect nutrition. And let me ask you finally whether on these conditions it is more than remotely possible such a person can be the subject of any serious organic disease. But presuming on the possibility of such contradictory evidence occurring in a single and exceptional case of real disease, will your credulity reach so far as to admit of their frequent occurrence? To you such cases will be presented singly and individually, but they are brought into courts of law in multitudes.

One of such cases I will give you as an example:—A man without property or profession brought an action against a railway company for injury to his spine. This statement, on the face of it, is an absurdity. How can a man without property bring an action at law? Well, he applies to a lawyer, who undertakes the case on his behalf, with a certain compact and understanding as to the question of future payment. Thus the lawyer becomes the plaintiff, and the plaintiff the witness in his own case. The man's injury was made out to the entire satisfaction of the jury, and very heavy damages were awarded by them, coupled with severe comments on the negligence of the railway directors.

It was positively known, at the time, by several persons engaged in the action, among whom was a detective officer, that within a few days of the trial the plaintiff, or the witness, whichever you please to term him, *had walked a match* against another man! Yet this man was declared on authority to have sustained a permanent injury of his spinal column!

With respect to hysteric affections of joints, knee cases, &c., they are in truth as common as Sir B. Brodie has declared them to be, and I thoroughly corroborate all he has said on the subject of this most important and interesting disease. Three-fourths of all knee cases in the upper classes of society, says this great authority, are not cases of inflammation, though they appear so. There is no organic disease whatever in the joint. They are cases of local pain, originating in impaired health. They are not amenable to treatment for inflammation and its consequences. Your liability to an error in diagnosis is just in proportion to the supposed infrequency of local nervous, as compared with vascular, derangement. The knee is by far the most frequent seat of these affections, and the cases are found among young women not in the lower class of life—but even this class is not exempt. You will find, on the occasion of your first visit, the patient walking lame. This lameness has existed for several days, probably weeks, before attention has been attracted to it, and has come on very gradually. The joint is stiff—not that it won't bend, but the movement is painful. There may be some increased heat in the joint, when compared with that of the opposite limb, but not much in degree. The knee is slightly swollen. If you see the case after treatment has commenced—*i. e.*, after the repeated application of leeches, blisters, and tincture of iodine (the almost universal agent in difficulty)—the swelling will be palpable, and the outline of the joint has undergone a change.

As the case progresses, the lameness increases, but the aspect of the joint remains as in the first stage—neither the swelling nor the heat increasing in the same proportion. In this condition the limb may remain for months, or even for years, subject to the same treatment, without improvement. One feature in this case ought to have struck you as worthy of notice—viz., that so many months have passed without organic change; the joint is neither stiffer, larger, nor hotter than it was in the early stage of the treatment. I say it ought to have struck you. Perhaps it has not! The aspect of this lady is that of unhealth. She has become pale, partly from depletion, partly from loss of exercise. Her pulse is weak, her appetite bad, and catamenia, as a rule, defective. You fear to give tonics and alcohol, lest you aggravate the supposed local inflammation.

Having exhausted the negatives in treatment, you now venture on an onward step, and you give bitter infusions, gentian, cascarilla, with ammonia and ether. But you are still behind the necessities of the case; you have adopted from the beginning a false diagnosis, and the difficulty is how to get back to the right groove. There is only one course: begin afresh, and treat your case on a different principle; convince yourselves that nerves may go wrong as well as arteries and capillaries, and as you treat excessive action, rightly or wrongly, in the blood-vessels by local depletion, so apply such remedies as check excessive action of nerves in the form of opium, belladonna, chloroform, &c. Build up the health by increasing the force of the circulation. The agents are a thoroughly nutritious diet, wine frequently in small quantities, tincture of bark, iron, fresh sea air, change of locality and associations, agreeable mental occupation. Assure your patient she has no real disease, but the semblance only. Leave the functions of the alimentary canal to take care of themselves. The constipation incidental to a low innutritious diet and an inactive life will subside under the influence of a nutritious one; improved health will restore its functions. There is no real harm in a day's constipation; it is sometimes a good. At all events leave the bowels alone. With regard to the joint, rub in some blue ointment and extract of opium, in the proportion of one-third of the latter, and roll it firmly with a flannel bandage. Encourage moderate daily exercise on a level ground, on a carpet, or on a lawn. If the case is chronic don't be disappointed if the progress be yet protracted to weeks. The pain and the stiffness may subside very slowly by virtue of their long possession by the joint; but you are in the right path, and rely upon it your patient's recovery will justify the sound principle of your treatment.

In the course of last year I was consulted by the family of a young lady of 18 years of age living at a distance from London relative to an affection of the knee from which she had been suffering for a period of ten months. The joint was stiff and painful; she moved about on crutches; there was no considerable amount of heat, and what alteration existed in the form and outline of the knee was due to the activity of the past treatment; the tissues had lost their natural softness and flexibility; the joint had been repeatedly leeched and blistered, and subjected to the application of liniments in variety of colour and composition; an issue had been made on the inner side of the patella, which, judging from the cicatrix it left behind, had not been a small one, and the curative influence of which had not been discoverable during four months, at the expiration of which nature was allowed to heal it.

I considered this a case of hysteria on the following evidence. The subject was a young lady of an hysteric age. She had sustained no sudden injury to the joint, neither blow, nor fall, nor sprain. The malady was gradual and spontaneous. Had the disease been of the inflammatory class, the remedies would have probably long since cured it. There was no appearance of disorganization otherwise than integumental. The pain was generally aggravated at the catamenial periods. Bending the joint afforded no evidence of disease within it, no grating or roughness of the cartilaginous surfaces. The pain varied greatly in intensity at different periods. This evidence was sufficient, and, to my judgment, conclusive. I strapped up her joint in an opium plaster. She took bark and iron and wine, and in a fort-

night began to walk about without her crutches; but two months had elapsed before her recovery.

Many years ago, when I was less familiar with hysteric affections, I attended the case of a lady of 19 in conjunction with Mr. Stanley. We both deemed the disease to belong to the class of inflammation, and conjointly adopted the usual remedies so indiscriminately resorted to in all painful affections of joints. Many weeks elapsed without improvement, and I remember that we discussed with some anxiety the probable issue in abscess, destruction of ligaments, absorption of cartilage, and ultimate amputation of the limb.

One day my patient informed me that her sister was going to be married, and that, cost what it might, she had made up her mind to attend the wedding. At this proposal I shuddered. Having expatiated, to no purpose, on the probable consequences of so rash an act, with all the force of language I could command, I determined to give stability to the joint for the occasion, and I strapped it up firmly with adhesive plaster. On the following day I visited her. She told me that she had stood throughout the whole ceremony, had joined the party at the breakfast, and returned home without pain or discomfort in the joint. Within a week her recovery may be said to have been complete.

This case first brought home to my mind the nature and the frequency of hysteric disease.

[Mr. Skey, after some preliminary remarks, proceeds to give a few examples of the less common forms of hysterical disease.]

A young woman, aged 24, was admitted into one of my wards at the hospital who was the subject of difficult deglutition. She was a very respectable person in character and position, and had been for several years a much-esteemed servant in a good family, and was a young woman of some education. For two months previous to her admission she had complained of difficulty of swallowing her food. As the evil appeared to increase, the family medical attendant was consulted, by whom she was treated for a stricture of the œsophagus. One or more consultations were held on her case, and the œsophagus examined carefully by means of probangs and bougies. These instruments, however, failed to pass a given spot corresponding with the base of the neck, or about one-third from the commencement of the tube. She had no local pain whatever. As the obstruction increased, nothing but semi-liquid food passed into her stomach, and this was only effected with a difficult and painful effort. She became emaciated by reason of defective nutrition, and at the time of her admission into the hospital was weak and somewhat attenuated in form. For many weeks she had taken no description of solid food, and even liquids passed the obstruction with difficulty. The malady now assumed a serious form, and with a view to additional advice she was sent to the hospital. The case was reported to me on her arrival as that of "stricture of the œsophagus," and I will tell you the preliminary train of thought that passed rapidly through my mind before I opened my lips to the students on the subject. Real stricture of the œsophagus is at all times a rare disease. When present it is almost invariably a cancerous affection. Cancer is a very rare disease at this woman's age. For so serious a malady as cancer she does not look ill enough; for though the presence of cancer of the breast occurring at a later period of life by twenty years may be for a time compatible with fair average health, cancer of the œsophagus stamps the constitution early. She is of an hysteric age, and though thin, she does not look absolutely ill. There is nothing of disease in her aspect, nothing that may not be referred simply to defective nutrition. The history of her case was given me by her medical attendant, who was present on the occasion, and I had no hesitation in recording her disease as that of "hysteria." I declined the use of a probang or bougie which lay on the table before me, and I simply said, "We will endeavour to remove the obstruction without the aid of instruments of any kind." Her catamenial discharge had been regular throughout. I ordered her bark, iron, valerian, wine, milk with brandy—each to be given in the largest quantities at the shortest intervals

consistent with reason and moderation; three times in twenty-four hours, enemata of thick soup with an ounce of brandy. These various agents were absorbed into her system with the greatest advantage to her health. Within a week she could swallow finely minced animal food, and in three weeks she ate a portion of a rump steak without difficulty, and was, in fact, convalescent. She was in high spirits at her recovery, and the only vexation she suffered arose from my refusal to pass a probang down her throat before she left the hospital. This I peremptorily declined to do, assuring her that a probang of rump steak was a far more efficient test of her recovery than any instrument in surgery bearing that name.

A young lady of 18, and of slight form, was brought to me from the country with gastrodynia. For upwards of a year she had suffered intolerable pain in the stomach on taking food of any description. She was much emaciated, and her pulse extremely feeble. Neither trouble nor expense had been spared in her treatment. Her family had consulted medical men of eminence in more than one metropolis, but the severity of the pain continued in spite of treatment. On entering the drawing-room, I heard the sound of suffering from an adjoining room, and I was told that my future patient was paying the penalty of a slight meal of arrowroot, of which she had swallowed a few table-spoonfuls only. Having intruded myself into the room somewhat unexpectedly by its occupants, I saw this young lady in a condition of great suffering, in the upright position, leaning her head upon her mother's shoulder and sobbing painfully. In the course of a quarter of an hour I had obtained some insight into her case, but I could not fail to observe that the mother habitually interposed replies to questions addressed to the daughter, and I explained to her the necessity of my obtaining the answers to my inquiries direct from her daughter. At my request she left the room. Up to that time I had but an imperfect knowledge of the case, but I then led the conversation to subjects which carried the girl away from her malady and all its associations. I spoke of her home and the scenery around it, of which I described the general characters, and enlarged on the beauty of the neighbourhood, the lovely rides and excursions, &c., and in all of which I was tolerably successful, considering that at that time I had never seen it. However, the description was sufficiently accurate for my purpose, for it succeeded in distracting the young lady's attention from her suffering, and during the few minutes which this conversation occupied she was to all appearance entirely free from pain. She talked freely and cheerfully, and not the slightest reference was made by either of us to her former suffering. I then changed the subject by saying, "I think your pain has flown away," when she immediately resumed her crying fit and sobbed as before. She assured me she was in great pain, and that the sensation had been but suppressed. That this was a case of severe hysteria was highly probable even had I gone no further with the evidence, relative to which the following thoughts occurred to my mind. What could be the nature of this pain if not hysteric? I was told by her family that pain followed the act of deglutition, not remotely or at any interval of one or more hours, but almost as immediately as the food could reach the stomach. This could not be dyspeptic or common gastrodynia, which waits on the process of digestion, and rarely occurs within a period of two hours of taking food. There is one disease only of the stomach in which pain follows the admission of food into it, and that occasionally only—viz., cancer. Was it probable, or scarcely more than possible, that this girl of 18 could have been for so many months the subject of undetected cancer of the stomach? If cancer, could the attendant pain, so severe as it appeared at the commencement of my visit, be suspended by conversation? It was neither gastrodynia, the result of indigestion, nor cancer; and if not, what remains behind to elucidate the case? It could be nothing but hysteria, and hysteria alone could solve the mystery. But she had been treated for gastrodynia, and treated for cancer, but she had not been under treatment for hysteria, simply because these varieties of local hysteria have never yet fixed themselves on the attention of the profession. To tell a practitioner of

the old school that a young lady was the subject of hysteria of the stomach would be to raise a smile at your expense.

It would be an unprofitable employment of our time were I to enlarge on the subject of the previous treatment. The remedies included, in different proportions and in varying doses, ammonia and other alkalies, under the mistaken supposition of acid secretions; opium in various forms, creosote, bismuth in small and large quantities, mineral acids, &c., &c.

How difficult it is to ascertain beyond all question the real value of many drugs in daily use amongst us! Although, in common with others, I have frequently employed the trisnitrate of bismuth, I have to this hour no conviction of its utility. This case did not terminate so satisfactorily as I hoped. That it was a case of hysteria admits of no doubt, but I had difficulties to contend with in the domestic management of the young lady. Although her symptoms remitted greatly under the use of remedies, she did not entirely recover in the brief period of three or four weeks during which she was under my care. I gave her small doses of ferrocitrate of quinine, two or three times a day a wineglass of port wine boiled with rice, and I ordered a plaster of the fluid extract of opium to be applied on the epigastrium. If, coupled with these remedies, I could have separated the girl from her family, whose sympathies with her were far too redundant for her benefit, I think she might have been cured in one month. In a case of this kind a good domestic moral treatment is indispensable to success.

Hysteric affections of the ovaries are extremely common. Several of such examples I attended with my late friend Dr. Rigby. The cases I have seen have occurred in young females of between 20 and 25 years of age. They are characterised by deep-seated aching pain in the region of the ovary, about two inches above the crural arch. My own observation would lead me to say that the right organ is more frequently affected than the left, but this is probably accidental. Like other hysteric affections, its severity varies with the constitutional health, mental and bodily. It yields but slowly to remedies, and though mitigated, it often returns at longer or shorter intervals. I have applied opium locally with advantage, but an entire change of air, scene, and occupation, combined with tonic treatment, are indispensable to recovery.—*Medical Times and Gazette, Aug.* 4 *and* 25; *Sept.* 22 *and Oct.* 13, 1866, *pp.* 109, 191, 309, *and* 385.

13.—ON THE SECONDARY COMPLICATIONS OF PAINFUL AFFECTIONS OF THE FIFTH NERVE.

By Dr. Francis E. Anstie, Senior Assistant-Physician to the Westminster Hospital.

It is to M. Notta that we owe the first scientifically arranged treatise on the subject of those complications which affect the organs of sense to which the branches of the fifth nerve are distributed. In a series of papers published in 1854 this author gives an elaborate analysis of no less than 128 cases of facial neuralgia, from which we gather the following important facts. In the first place, as regards the organs of special sense. The retina was completely or almost completely paralysed in 10 cases, and in 9 others vision was interfered with, partly, probably, from impaired function of the retina, but partly also from dilatation of the pupil, or other functional derangement independent of the optic nerve. The sense of hearing was said to be impaired in 4 cases. The sense of taste was perverted in one case and abolished in another. Next, as regards modifications of secretion. Lachrymation was observed in 61 cases, or nearly half the total number. The secretion of the nasal mucous membrane was repressed in one case, in 10 others it was increased, upon the affected side. Salivation was observed in 14 cases. Unilateral sweating is spoken of more doubtfully, but is said to be probably present in some cases. Elevation of temperature is said to be present on the affected side of the head in an undetermined but probably a considerable number of cases. In 8 cases there was decided unilateral redness of the face, and five times this was attended with noticeable *tumefaction*. In one case the

redness and tumefaction occurred, not only in the accesses of neuralgic pain, but also persisted in the intervals, and, in fact, were accompanied by a definite hypertrophy of all the tissues. In the conjunctiva vascular dilatation was far more frequent, occurring in as many as 34 cases. As regards *lesions of nutrition*, hypertrophy of the tissues of the affected side of the face was noted in 4 cases, in 2 the hair was noticed to be hypertrophied at the end, and several others are referred to in which the hair turned grey, or fell. The tongue also is reported to have been greatly tumefied in one case. As regards *muscular affections*; there were noticed convulsive contractions of the muscles of the affected side in no less than 52 cases. Of these 13 are noted as instances of contractions of the muscles of the lip and nostril, 10 as tremor of the eyelid; in a great number of cases many muscles were simultaneously affected. *Permanent tonic spasm* was observed in the eyelids in 4 cases (when it was not due to photophobia), in 4 cases in the muscles of mastication, and in one instance in the muscle of the external ear. *Paralysis of the motor oculi*, inducing prolapse of the upper eyelid, was noted in 6 cases, and in the half of these cases there was also external strabismus. In 2 cases the facial muscles were paralysed, obviously not from an original affection of the portio dura, but from severe neuralgia of the auriculo-temporal branch of the fifth. As regards the pupil, it was dilated in 3 cases, and contracted in 2 others, without any simultaneous affection of sight; in 3 other instances it was dilated, coincidently with considerable diminution of visual power. Finally, with regard to common sensibility, M. Notta reports 3 cases, in which anæsthesia was observed. With regard to the hyperæsthesia so often noticed, he justly observes that it only occurs in the more advanced stages of the disease.

I have analysed the results obtained by M. Notta somewhat at length, because, with regard to the majority of the complications of facial neuralgia observed by him, my experience affords ground for the belief that his estimate of their proportional frequency is very correct, and I therefore preferred to give you his figures because they are drawn from a larger number of cases than my own. But there are certain especial complications, which are either not noticed or are noticed so cursorily by M. Notta, as well as by Valleix, Romberg, and all the other writers whom I have studied, that I cannot refrain from citing my own experience.

The first group of cases which have thus particularly attracted my attention are distinguished by the presence of remarkable affections of the vaso-motor fibres.

The most important of these is facial erysipelas. Some years ago I was much surprised at observing, in a woman 32 years of age, an out-patient of the Chelsea Dispensary, a most acute attack of unilateral erysipelas of the face and head, supervening after she had suffered for two or three weeks from very severe and frequently recurring attacks of neuralgia, which affected all three branches of the fifth, but was most violent in the branches of the ophthalmic division. On the occurrence of the erysipelas the acute pain subsided, but the most intense tenderness remained for some days, and pressure anywhere in the track of a considerable branch of the nerve would re-excite a momentary spasm of neuralgic pain. Since that time I have been constantly on the look out for similar cases, and I have made some observations for which I was not at all prepared. In some cases I have actually seen neuralgia of the fifth terminate in well-marked erysipelas of a strictly unilateral character; in four of these cases it was limited to the side of the nose, the infraorbital and frontal regions; in all of these the neuralgic pain had been limited to the supraorbital and superior maxillary divisions of the nerve. The last of these patients was a young man who came under my care at the Westminster Hospital a few weeks since, suffering from commencing erysipelas of the left side of the nose, forehead, and cheek. The circumstance which principally attracted my attention was a convulsive action of the left eyelid, such as is often observed in neuralgic affections. On questioning the patient, a very clear history of a previous severe neuralgic attack was elicited, and the existence of extreme tenderness to pressure

in two limited spots, corresponding to the supraorbital notch and the infraorbital foramen, was ascertained; there was also intense photophobia, lachrymation, and conjunctival congestion.

But the facts concerning the connection of facial neuralgia with facial erysipelas are by no means limited to the cases in which the one absolutely terminates in the other. In no less than 22 patients who have come under my care suffering either from well-marked facial neuralgia, or else from severe migraine or from "hysterical" headache, I have discovered the existence of a very strongly marked tendency to facial erysipelas, an attack of which would be brought about by the most trivial causes, such as very slight exposure to cold wind, or, on the other hand, such seemingly different influences as fatigue of body, or unusual mental anxiety or depression. I have now under occasional observation five individuals, in good circumstances of life, in all of whom there is a strong tendency, which is clearly inherited, to facial neuralgia, and an equally remarkable tendency to facial erysipelas, though it happens that in no instance of which I am aware has either of these persons suffered from erysipelas *directly* following a neuralgic attack. In another patient, also in good circumstances, and who recently died at a very advanced age, a strong inherited neuralgic tendency first manifested itself by a distinct outbreak of severe pain, which passed into the worst kind of confirmed tic, shortly after the termination of an acute attack of erysipelas.

Another class of complications which I have particularly observed in facial neuralgias is a series of changes in the nutrition of parts supplied by branches of the fifth nerve. In a former lecture I referred to my own case, and I may now recount it as an illustration of several of these changes. In the first place, a year or two after the commencement of my attacks of frontal neuralgia, and at a time when the pains had been very severe, there occurred a painful thickening and tumefaction of the periosteum of the eyebrow, and also the formation of one or two dense white patches on the cornea, in the centre of which small phlyctenular ulcers formed. About the same time, probably, there occurred a great thickening of the fibrous tissue surrounding the upper end of the nasal duct, which formed a very thick and solid stricture. Some years later, when the neuralgic attacks had become on the whole much less frequent, they recurred with great severity during the state of prostration in which I was left by an attack of choleraic diarrhœa. At this time I first noticed that the hair of the eyebrow was whitened opposite the supraorbital notch, and that grey hairs were thickly strewn over the right side of the head for some time after the attack; and this phenomenon has occurred after every severe attack since that time. It only lasts in intensity for a few days, and the colour soon becomes restored nearly to its natural tint without any falling off of the hair. Unilateral herpetic eruptions (a not very uncommon sequel of one form of neuralgia) have not occurred in my own case. Another nutritive phenomenon which has occurred to me during a spontaneous attack of pain, but which was also produced artificially on one occasion by experimentation with narcotics, is an excessive unilateral development of epithelium on the tongue.

All these several changes I have repeatedly observed in neuralgic patients. I have even seen one of them—namely, the occurrence of fibrous stricture of the nasal duct, which might appear an acidental coincidence in my own case—reproduced under exactly similar circumstances in a female patient; and I suspect that closer inquiry into the history of many cases of epiphora depending on this sort of obstruction would reveal the previous existence of neuralgia of the ophthalmic division of the fifth nerve.

But there are also other and more distant affections of bodily organs which may distinctly be traced to the secondary effects of a morbid condition of the fifth nerve extending itself to nerves which are centrally connected with the trigeminal. The occurrence of vomiting in attacks of migraine which have a certain intensity and duration, is a typical example of this kind of reflex phenomenon.

Time, however, will not allow me to dwell on the wide field of observation and enquiry which is presented by these more remote affections; and I must

now pass on to the consideration of Diagnosis. It is chiefly with reference to their important bearing on this part of our subject that I have dwelt so particularly on the secondary nutritive changes which are apt to supervene in cases of neuralgia of the fifth nerve.

The first question which occurs for consideration is—how to decide that a painful affection originates in the fifth nerve at all?

Ever since the time of Valleix, most authors have disposed of this question summarily by inquiring as to the existence or non-existence of certain *tender points* at particular situations in the course of various branches of the fifth nerve. Supposing it were possible that a patient should be affected with universal and equally violent neuralgia of all the principal branches of the nerve, the situations in which the most important of these painful points would be developed are such as you see marked on this diagram: 1. The parietal point. 2. The supraorbital. 3. The trochlear. 4. The palpebral. 5. The ocular. 6. The nasal. 7. The infraorbital. 8. The malar. 9. The superior labial. 10. The mental. 11. The auriculo-temporal. [The lecturer gave many details as to the size and form of each of these tender patches.] Pressure on any of these points, even in the intervals of the neuralgic attacks, causes an exquisitely acute pain to dart along to the terminal branches which lie external (peripheral) to the tender spot.

Valleix insisted that no painful affection could be truly styled neuralgic unless one or more of these tender points could be discovered; and he denied altogether the statement which up to his time had commonly been made, that pressure over a neuralgic nerve does not increase the severity of the pain. Other observers, seeing very plainly that many cases of neuralgia clearly do exist in which pressure over the points which I have enumerated does not cause or increase pain at all, have recently proposed to make two classes of neuralgiæ, between which the existence or non-existence of the painful points should form the line of separation.

I feel some confidence in stating my opinion that neither of these views is strictly correct. In all the severest cases of neuralgia which I have witnessed from the beginning, equally with those of a milder type, there was not, in the first instance, any tenderness on pressure over any point in the course of the affected nerve. But in every case in which the pain assumes a certain intensity, and lasts long enough, there occurs more or less tenderness, and sometimes decided swelling and hypertrophy of the fibrous tissues with which it comes into the closest relations, and this, as a matter of anatomical distribution, is precisely what occurs at those points which Valleix so carefully indicated. It would be easy to show that these are situations at which the nerves divide into branches, which pass through the deeper layers of fibrous fasciæ, to become immediately subcutaneous. I believe, then, that it is the subacute inflammation, or at any rate hypertrophy, of these tissues which causes the formation of the tender points. This I am sure of, that in one case I have seen attacks of common migraine which were of longer duration than usual followed not merely by general tenderness of the forehead and scalp, but even by the temporary formation of an extremely tender supraorbital point, indistinguishable from that of the most undoubted neuralgia; and, in fact, the disease from that time assumed the latter type. And the cases in which the hyperæsthesia is most excessively developed at special points are precisely those inveterate examples of tic douloureux which occur in the decline of life: the longer these cases last, the more exquisite does the tenderness become. Moreover, it has been observed in the dissection of cases of inveterate neuralgia that the hypertrophy of fibrous tissues, and even of bone, was principally developed around the foramina of emergence of the principal trunks of the nerve; and this agrees in a remarkable manner with the result of the experiments by Schiff and Mantegazza, to which I referred in my first lecture.

I may notice here that Dr. Handfield Jones, who has done so much for the investigation of nervous diseases, so far favours the above interpretation of clinical facts, that he speaks (in his valuable work on "Functional Nervous Disorders," p. 292) of some cases observed by Watson and Brodie (in which *the parts affected with pain at length became hot, swollen, and tender*) as mark-

ing a "transition" from a paretic state of the cerebro-spinal nerves, merely, to a paretic condition both of these and of the adjacent vas-motor nerves.

The test of Valleix therefore, although highly useful in its way, appears to be misleading when used in the sense in which he employs it. Its true use would rather seem to be as a prognostic of the severity and probable duration of the complaint, for there is no doubt that the long-continued existence of two or three or more exquisitely tender points is itself a very bad omen; and on the other hand, the rapid subsidence of this local tenderness is some evidence that the affection is mild, or at any rate is not far advanced.

If these and the other arguments which I have previously used be just, there is then no need to draw a line of radical separation by refusing to consider the milder affections, which we call sick headache, or hysterical headache, or headache of debility, as nerve pains, though it may be well to keep the conventional use of the word "neuralgia" for the severer forms of nerve pain. And on the other hand, in the instances (which I believe to be far more rare than many suppose) in which irritation transmitted from a distant organ is the exciting cause of trigeminal nerve pain, the fact is not to be lost sight of that in all probability the antecedent condition of the nerve itself is the most important factor in the product, which is pain. And as we are on the subject of diagnosis, it may be well to observe that nothing can be more objectionable than that kind of logic which, for instance, when a course of medication with some drug already ticketed "emmenagogue" has simultaneously established menstruation and relieved a neuralgic pain, would therefore decide that the neuralgia had depended on "uterine irritation."

With regard to the diagnosis between the various forms of trifacial nerve pain which are the subject of these lectures, there will generally be little difficulty if the characteristic features which have been already described are relied on as the main guide.

And, finally, with regard to the diagnosis of the situation of the peccant point in the nerve in those neuralgiæ which presumably arise from an organic change: the result of the physiological considerations which I laid before you at our first meeting will convince you that the apparent situation of the pain will in reality tell you little. The physiological law by which sensations that originate even in the most central origins are nevertheless subjectively referred to the peripheral distribution of nerves makes it futile to draw inferences from the sensations themselves. Far more knowledge will, I believe, be gained by a careful study of those complications which I have endeavoured to show you are not merely accidental attendants, but essential portions, of severe painful affections of the fifth nerve. The wider the area over which the secondary phenomena are scattered the greater the probability that the mischief is central, and has thus the greatest number of radiating channels for its secondary influence. And it is this principle which forces us, as I think, to place such affections as migraine and clavus in the same pathological group with the severest tic douloureux, and to separate them utterly from the headaches felt under circumstances of fatigue or "biliousness" by non-neuralgic subjects. Contrast the dull diffused pain (bilateral, and felt nearly always most strongly at the back of the head) which is the simple result of indigestion, with the quick darts of agony, limited strictly to one nerve, and very generally to one division of it, which characterise a true migraine, or "sick headache." And observe, in the latter affection, how, as the severity of the pain increases, two secondary phenomena are developed at the periphery of two nerves which are widely separated except at their one point of connexion in the medulla—viz., the secretory fibres of the fifth, and the vagus. The simultaneous disturbance of these two sets of nerve fibres is plainly indicated by the occurrence of *intense lachrymation* on the one hand, and of *vomiting* on the other. But there is more to come on this subject of diagnosis which may be more conveniently taken under the head of Etiology and Pathology, because it is essentially mixed up with questions as to the hereditary transmission and transformation of disease.—*Lancet, Aug.* 25, 1866, *p.* 199.

14.—APHASIA ASSOCIATED WITH RIGHT HEMIPLEGIA.

By Dr. Edward Long Fox, Physician to the Bristol Royal Infirmary.

The following cases may add to the collected experience on loss of speech.

Mary M., aged 13, was in her usual health at the beginning of May. She was sent by her mother to a shop, and on her way fell down insensible. She was found to be hemiplegic on the right side, and to have lost all articulate speech.

On admission into the Bristol Royal Infirmary, June 5th, 1866, the right hemiplegia was almost complete. She could not lift the right arm at all, nor flex the fingers; and she could scarcely stand. She could not walk at all. Slight facial paralysis of right side. No paralysis of tongue. Organs of special sense unaffected. Pupils natural. Sensation good everywhere. There was no loss of the general faculty of speech, as she could express herself fairly well by signs, and nodded or shook the head rightly. She evidently understood all that was said to her, and the expression of the face was very bright. But she could not pronounce any thing except "ta" and "to," and had lost all power of saying another syllable. She had never suffered from rheumatism; had no valvular disease of the heart; and was a pale, cachectic-looking child.

June 30th. She had so far recovered as to be able to walk about and to move the arm well, but she could not clasp with the fingers. She had learned several words, as "yes," "no," "tea," "bun," &c. She seemed very bright, and read to herself with evident pleasure.

Two or three days after this her mother secretly brought her in some cheese and port wine. She became intoxicated, fell into a succession of convulsive attacks, and sank during the night.

We were only able to examine the head:—Much black discoloration along the fissure of Silvius on the left side. Beneath this region was an old clot, partially discoloured, with creamy brain-tissue all round it, the softening extending slightly into the anterior lobe, but mostly into the middle lobe, and implicating the corpus striatum, except the upper layer of it. This clot was evidently the result of a ruptured left middle cerebral artery. Just at the commencement of the fissure of Silvius the artery was enlarged to the size of a small haricot bean, and this enlarged portion had given way. No plug was found in any of the vessels. The posterior portion of the third left frontal convolution was discoloured for about one-fifth of an inch in depth, and sensibly softened over a space the size of a small walnut. The immediate cause of death was the rupture of a vessel in the left lateral ventricle, on the upper and outer side of it, just above the corpus striatum. The whole of this ventricle was full of clot, which filled all the cornua, and had found its way to a small extent into the right lateral ventricle. The rest of the brain was healthy. Considering the amount of lesion in the corpus striatum, it seems extraordinary that she should have recovered the use of the limbs so well.

I add the following cases of a similar nature:—

Wm. D., aged 47; a great drunkard. Right hemiplegia, with total loss of speech, except that he utters the words "yes," "no," "pooh," "Lord-a-mercy." These he uses indifferently to express every thing; and when he is in a passion he will ejaculate "Lord-a-mercy," evidently with the idea that he is using an oath. He can to some extent express himself by signs; as when he can escape from his wife's surveillance he is able to get spirits from a public-house, and pay for them without any assistance. He can write his own name, and understand all that goes on. He has been quite three years in this state; and although the hemiplegia is much diminished, the loss of speech is the same.

John S., aged 35. At ten years old he had right hemiplegia, loss of speech for three months. For six months afterwards he had to learn to speak like a little child. He has now contractions of the right wrist.

Although both these cases are still living, it is probable that they have suffered from a similar lesion to that which caused the symptoms in the first patient, especially when we view the symptoms in connexion with the case quoted by S. Van der Kolk (New Syd. Soc., vol. iv, p. 165, note). "In consequence of a wound, a long splinter from the os frontis above the left eye compressed the anterior part of the left hemisphere, subsequently causing loss of speech; which faculty was completely regained after the removal of the fragment by the trepan."

Some very striking cases, mentioned by Abercrombie and Andral, show at least the connexion between the symptoms of loss of speech and lesion of some portion of the left frontal convolutions.

No one can study Broca's views, nor the very excellent papers which Dr. Hughlings Jackson has written on this subject, without acknowledging that there is considerable evidence in favour of the seat of the faculty of articulate speech being located in the posterior portion of the third left frontal convolution. Dr. Jackson's papers are written with so much scientific accuracy, and with so much candour and fairness, that they are models of the result of medical observation; and in a late paper he modifies his adhesion to Broca's views. But, as far as the subject has been investigated at present, I think it has only been proved that this portion of the brain is one of the seats of this faculty, and not the only seat.

In confirmation of this view I would mention—

1. S. Van der Kolk's case. (New Syd. Soc., vol. xi.) Right hemiplegia. Partial imbecility. She had learned to speak, and made known her wants in broken language. Atrophy of left hemisphere of brain and atrophy of right side of body.

2. Abercrombie on the Brain. (Case 37.) Right side convulsed and then paralysed. No loss of speech. Two defined abscesses, containing six or eight ounces of pus, one behind the other, in anterior part of left hemisphere, near the surface. A small abscess in posterior portion of right hemisphere. One would imagine that these two large abscesses must have implicated more or less all the convolutions of this anterior part of the brain.

3. Andral. (Clin. Med., vol. v., p. 392.) No paralysis. No loss of speech. Softening of base of anterior part of left hemisphere over a space the size of a hen's egg.

4. Andral. (p. 66.) Child, aged two. Permanent contraction of limbs, especially of right forearm. Intellect good. Speech good. The pathological appearances are thus described: "On trouva le lobe antérieur de l'hémisphère gauche comme déprimé par un sillon que remplissait une infiltration séreuse de la pie-mère. Les circonvolutions étaient refoulées en dedans, rapetissées, dureies et jaunâtres: le septum lacidum n'existait point."

5. Mary Ann C., aged 71. (Case of my own.) Left hemiplegia. Speech not lost, but no words could be understood. She sank in the course of two months. Clot in middle of right hemisphere. Arteries of brain atheromatous. An exostosis, the size of a nut, from inner table of left parietal bone.

6. Quoted by Abercrombie. (Appendix, Case 32.) Woman, aged 77. Left hemiplegia. Loss of speech. Large cancerous mass in right hemisphere.

7. Quoted by Abercrombie. (Appendix, Case 35.) Boy, aged 13. Left hemiplegia. Loss of speech and of memory. Tubercle, the size of an egg, and five or six smaller masses in the substance of the right hemisphere. Pus between arachnoid and pia mater. Turbid fluid in ventricles.

8. Andral. (p. 316.) Right hemiplegia. Loss of speech. Clot in posterior lobule of left hemisphere. With reference to this case, Andral says: "If, then, a former observation, in which we have also seen loss of speech, seems to confirm the opinion which places this faculty in the anterior lobules of the hemispheres, this observation completely nullifies that opinion."

9. Andral. (p. 322.) Woman, aged 55. Right hemiplegia. Loss of voice and of speech. Extravasation in middle of left hemisphere, and softening for the space of two or three lines round it.

10. Perhaps this case, quoted by Abercrombie, (Appendix, Case 23),

should be added. Man, aged 26. Severe and increasing headache. Impaired vision and dilated pupil. Paroxysms of giddiness, with blindness, loss of speech, stiffness of the limbs during the paroxysms; then double vision, violent pain in the neck, with convulsive paroxysms affecting the muscles of the neck, and drawing the head violently backwards. Two months after this he had numbness and spasmodic motions of the superior extremities. After seven or eight months he died suddenly in a fit resembling epilepsy. A hard tumour, two inches long and an inch and a half broad, was firmly attached to the tentorium, and imbedded in the posterior lobe of the left hemisphere. It contained an ounce of greenish pus, and the cerebral substance near it was softened.

11. Andral. (p. 454.) Woman, aged 80. Loss of speech, intellect clear. No motor paralysis. A softening, the size of a large pea, just outside the posterior extremity of left corpus striatum. A softening of similar size exactly in the middle of right hemisphere.

On our present question Andral made the following remarks more than thirty years ago:—

"Professor Bouillard published some years ago a memoir filled with curious facts, from which he thought himself able to draw the conclusion that the formation of speech has as its instrument the anterior extremity of each hemisphere, inasmuch as he found lesion of that part whenever during life speech had been lost. But mark what our researches have shown us with reference to this question. In thirty-seven cases observed by myself, or by others, in relation to hemorrhages and other lesions, in which the alteration was situated in one or both of the anterior lobules, speech was abolished in twenty-one cases and preserved in sixteen. On the other hand, we have collected fourteen cases in which speech was abolished without any alteration of the anterior lobules. Of these fourteen cases seven were connected with disease of the middle lobes, and seven others with disease of the posterior lobes. Loss of speech is not then the necessary result of lesion of the anterior lobes; and besides, it may take place in cases where anatomy shows us no alteration in these lobes. We will add that M. Lallemand has cited a case in which no other alteration was found than softening of the white substance of the left lobe of the cerebellum; in this case the faculty of speech was completely lost. You will read also in M. Ollivier's work on the Spinal Cord an observation of an individual in whom one of the chief phenomena was the loss of speech, at first incomplete, and then total: in this case the meso-cephale was found softened at its interior surface to an extent equal at least to a filbert."

I have thought that these cases might help in the investigation of a very interesting subject.—*Lancet, Aug.* 11, 1866, *p.* 145.

15.—TREATMENT OF DELIRIUM TREMENS BY CAPSICUM.

By Dr. Lyons, Richmond Hospital, Dublin.

[The patient was a man 40 years of age.]

When seen on the 25th March he presented the well-marked phenomena of delirium tremens, and for many days and nights had had no sleep.

Dr. Lyons having, on more than one occasion, previously employed with success the treatment by capsicum, specially recommended to his notice by his friend, Dr. Kinnear, Director of the Melville Royal Naval Hospital, Portsmouth, determined to give it a further trial in this case, in which, for various reasons, it appeared to be indicated, and ordered the patient thirty grains of the powder of capsicum, to be made into a bolus and administered immediately. The dose was taken without any difficulty, notwithstanding that some slight burning sensations were felt in the mouth and throat for a time, and a sense of diffused warmth through the stomach and bowels for a brief period subsequently. In less than one hour after the bolus was taken he fell into a quiet sleep, and some three or four hours subsequently awoke, perfectly calm, conscious, and convalescent. It is much to be regretted that notwith-

standing that he was perfectly reasonable, and in all respects quite free from any symptoms whatever of the condition of delirium tremens, a draught, containing 30 minims of gutta nigra, was administered about 10 a. m., this medicine having been ordered in the morning, to provide for the possible failure of the capsicum dose; but of the efficacy and satisfactory result of the former no reasonable doubt can remain. No stimulants were employed at any time in this case. Convalescence was rapidly established, and the man left hospital in a day or two, himself and his wife in no little degree surprised at the almost magical effect produced by the dose of so familiar an article as that employed.

The results obtained by Dr. Lyons in the use of this drug fully bear out the experience acquired on a far larger scale of observation in the West Indies and in the Melville Hospital by Dr. Kinnear, Dr. Lawson, and others of his distinguished colleagues in the public service at home and abroad. In the records of the Melville Hospital not less than seventy to eighty cases are reported to have been successfully treated by the sole use of this drug in single or repeated doses, ranging from one scruple upwards. No gastric disturbance or other unpleasant symptom has been at any time noticed.

As a stimulant of great and immediate efficacy, Dr. Lyons considers that its action may be explained by the direct influence it exerts upon the gastric expansions of the vagi, and so indirectly upon the cerebro-spinal centres. The phenomena of the disease he considers to point to a double condition of stimulated excitation and partial paralysis of distinct and perhaps opposite portions of the nervous system.

For general employment it cannot be doubted that, as pointed out by Dr. Lyons, the use of capsicum offers many advantages over either opium or digitalis. In cases of recurrent delirium tremens associated, as they often are, at a somewhat advanced period of life, with fatty degeneration of the heart, both the latter drugs are very distinctly contra-indicated, and their use has not infrequently been attended with results far from satisfactory, even when free from fatal result, which has not always been the case.—*Med. Press and Circular, April* 18, 1866, *p.* 395.

16.—CASES OF SCIATICA, DEPENDENT UPON APPARENT OR ASSUMED STRUCTURAL LESIONS.

By Dr. William Leishman.

The following cases were presented in the course of a clinical lecture in illustration of the etiology of sciatica, in that class of cases where the ordinary symptoms are the result of structural changes, either in the tissues in juxtaposition with the nerve, or in distant organs; the disease being in these instances merely symptomatic of other affections. It would be obviously erroneous to rank such as ordinary cases of sciatica, and still more so were we, in view of the whole facts, to treat the mere symptom as if it were the disease. The cases are in themselves instructive, as showing how treatment is so frequently inefficacious. In some, the symptom being at first in no way distinguishable from those of ordinary sciatica, the usual treatment was adopted, but without any satisfactory result beyond a mere temporary alleviation of the pain. Indeed, it may be said that in all the cases, their true nature was only recognised after prolonged and careful investigation. The cases are still under treatment, but as far as this has gone, it must be confessed that it has been, on the whole, unsatisfactory.

Case 1.—*Sciatica, associated with Congestion of the Uterus, Leucorrhœa; symptoms relieved by leeches to os uteri.*

Ann M., aged 38. Admitted June 29th. Patient, who has been married for some time and has had three children, states that her present illness commenced about seven weeks ago. Although never a very strong woman, being subject to what she calls "fits of debility," when her strength appeared to leave her altogether, she has always been tolerably healthy up to this present attack. Her labours have all been natural, the children healthy, and menstrua-

tion most regular. Seven weeks ago she first began to experience pain in the lower part of the back, extending down the leg, sometimes as far as the toes, the right leg being the only one affected. This pain has never left her and she has been getting weaker and more helpless, walking now with a decided limp. About nine weeks ago, a fortnight before this pain commenced, she noticed a white discharge from the vagina, which has continued, more or less, up to the present time, but is not so bad now as it has been. She refers the pain to several positions, the spot where it is worst and most constant being immediately over the sacrum. It is also felt in both buttocks, most severely in the right, extending down the right thigh. It is to some extent constant, but has paroxysms of severity, during which it occasionally passes across the back into the groins in front, but this is rare. When sitting up, she has a feeling of weakness up the whole spine. General health is good, although her strength has been failing her of late. Bowels have a tendency to be costive unless relieved by medicine.

July 8th. Fly blister to be applied over sacrum. The white discharge from the vagina has, at this date, ceased.

July 10th. On examination with the speculum the os is seen to be slightly open, with a white, glairy discharge exuding from it. Lips and cervix enlarged and somewhat congested, but without any ulceration or abrasion of the mucous membrane. She experiences considerable pain when pressure is exercised on the os, or in its neighbourhood. Leeches to be applied to os.

July 12th. Two leeches were yesterday applied to the os and a considerable quantity of blood withdrawn; this was accompanied by an almost immediate relief from pain both in the back and thigh. This morning the improvement is maintained, and she says that she is very much better than she has been at any time since admission, although there is still some pain in the right thigh.

This case requires no comment. The opinion that the pain in the course of the right sciatic nerve was dependent on uterine irritation or congestion was strengthened on examination by the speculum, and was confirmed by the result of local depletion from the important organ in question. A repetition of the bleeding was followed by similarly good results; and at the present time, while this report is passing through the press, the patient may be said to be nearly well.

Case 2.—Lumbago and Sciatica connected with, and probably dependent upon some affection of the nervous centres; Paralysis agitans; Abnormal Sensations.

Daniel G., aged 60. Admitted June 29th. Rather more than a month ago patient began to complain of a severe pain across the back, extending down to the right leg as far as the knee. This has continued up to the present time, almost constantly present, but at times almost unbearable. He refers the pain to a line corresponding to the course of the sciatic nerve. Three weeks ago (previous to his admission) he was severely cauterized by Corrigan's iron down the back of the thigh, numerous small, round, suppurating eschars still remaining, and this treatment gave him some relief, at any rate lessening the pain in the thigh, the worst at present being in the right buttock. Patient has also a pretty severe cough, with a copious frothy expectoration. He appears to be in a nervous condition, especially when spoken to, and his hands shake much when he attempts to move them. He seems startled, and answers questions in a hurried, confused manner. His general health is tolerable, appetite unimpaired, but he complains of weakness, and a constant sensation of chilliness even when in bed. Bowels habitually costive, chest and heart sounds normal, with the exception of some slight bronchitic râles. Urine contains no albumen. Ordered the acetate of potash, and recently the nitrate of bismuth for some irritability of the stomach.

Case 3.—Sciatica, treated by Corrigan's iron, acetate of potash, quinine, and subcutaneous injection, in succession, but without benefit. Discovery and development of a large abscess.

Alexander Maxwell, aged 26. Admitted May 22nd. Patient admitted

complaining of almost constant pain in the left leg. extending from the buttock down the back of the thigh to knee. He states that this first began to trouble him about six months ago, it has been much worse lately, and he is now scarcely able to walk, much less to work, the pain being aggravated on the slightest exertion. On examination, no swelling of any kind can be detected, with the exception of some enlargement of two or three lymphatic glands on the inside of the thigh. Corrigan's iron to be used.

May 25th. ℞. Potass. acetat. ʒss; aquæ ʒxxiv. s. Sig. A wine-glassful three times a day.

June 15th. No improvement. Patient complains somewhat of loss of appetite. A strong solution of acetate of morphia was yesterday injected subcutaneously, but even this was only followed by a very slight temporary alleviation of the pain.

℞. Quiniæ sulphat. 3i; acid. sulph. dil. 3iiss; aquæ ʒviii. s. Sig. A tablespoonful three times a day.

June 28th. A large, deep-seated abscess is forming in patient's left gluteal region. He has had several severe rigors, and has lost flesh considerably of late. Pulse rapid and compressible, appetite bad. To have 8 oz. of port wine daily.

30th. Hectic symptoms more marked. The fluctuation is now more distinct, and the abscess appears to come nearer the surface day by day.

July 3rd. This morning the abscess was opened by an incision in the middle of the buttock, a large quantity of pus escaping.

11th. Patient still in a very weak state; complains of very profuse perspirations. The discharge is still abundant, but sinuses seem to be forming down the thigh from which the matter is only dislodged by pressure.

Case 4.—Case of Sciatica, dating from an injury. Unsuccessful treatment. Probable local lesion.

Ward 1. Bartholomew C., miner, aged 18, admitted May 23rd. Five months before admission patient was bruised at the lower part of his back by a hutch coming against him. He was confined to bed for a short time, but was soon at work again. About six weeks after he received the injury, he began to feel pain in the right buttock, going down the back of the thigh as far as the knee, and sometimes extending as far as the ankle. Immediately after the accident the right leg lost feeling and power, to a slight extent, and even at the present time patient occasionally has a feeling of weakness and want of power in it. The pain in the buttock is constantly present, and is worse when patient is in a sitting posture. The pain is not aggravated by moving the limb, nor is there any shortening or swelling. He sometimes experiences pain over the lumbar vertebræ, especially on stooping, exactly on the spot where the bruising from the hutch was most severe. There is no swelling or undue vertebral prominence in this situation. General health good.

June 16th. To have five drops of Fowler's solution three times a day.

June 30th. Complains of some tingling of the eyelids. Tongue covered with a silvery white fur. Fowler's solution to be continued with caution.

July 3rd. The constitutional effects of the arsenic being now manifest, this to be discontinued. The subcutaneous injection of morphia, and acupuncture, have both been tried without success. Blister to be applied to the painful part.

July 12th. Patient not in the slightest degree improved. His general health is beginning to fail.

Case 5.—General Neuralgia with Sciatica, successfully treated by the Bromide of Potassium. Recurrence of symptoms. Disease of the spinal column.

Ward 1. Francis K., aged 26. Admitted May 8th, 1866. Patient was in the hospital rather more than a year ago, under treatment for the same symptoms that he is at present suffering from, namely, pain in the back, shoulders, and limbs. He remained under treatment for some time, underwent various changes of treatment, and ultimately improved rapidly under the bromide of potassium, which was given when all else had failed. He has had no return of the complaint until six weeks ago, when the pain re-com-

menced in the back and shoulders, disappearing when at rest, but coming on when he is walking or making any exertion. It is getting worse of late, and he can scarcely move with it at present. He refers the principal pain to the back, extending from the dorsal vertebræ downwards, and to the left side, but it varies considerably as to position, and occasionally travels down the legs or affects both shoulders very severely. General health good. There is no swelling of any of the joints. Chest and heart sounds normal.

℞. Potass. bromidi, 3i.; aquæ, ℥viii. s. Sig. A tablespoonful three times a day.

July 11th. Patient, though at first much benefited by the bromide of potassium, has of late been getting gradually worse, the pain, especially in back, being more severe than on admission, and patient is in a state of great weakness from his protracted illness. He cannot walk now at all, and any movement in bed is attended with great pain. On carefully examining the spinal column, the spinous process of one of the dorsal vertebræ (the third) is found to be abnormally prominent, and there is marked tenderness on pressure at this point. General health of late has been failing rapidly; he takes but little food and has lost flesh and strength.—*Glasgow Med. Jour.*, *Aug.* 1866, *p.* 155.

DISEASES OF THE ORGANS OF RESPIRATION.

17.—ON TUBERCULOSIS.

(An Abstract from Virchow's Krankhaften Geschwülste.)

By Dr. Francis Delafield, New York.

One of the greatest living pathologists has definitely formulated his views concerning that most difficult subject—tuberculosis. No English translation of his work has yet appeared. This short sketch of his treatise may be of interest.

The lymphatic glands consist of cells, the so-called lymph cells, contained in a fine reticulum of connective tissue, and arranged in follicles divided by fibrous sheaths. These follicles may form large masses, as in the thymus, the tonsils, and in Peyer's patches; or they exist singly, as in the solitary intestinal glands, and the malpighian bodies of the spleen. The essential element is, in all cases, the cells.

There are two groups of tumours analogous in structure to these lymphatic glands. First, hyperplastic growths of already existing glands; second, heteroplastic growths of the elements of glands, where none such normally exist. To the second of these groups belong tubercles. There are two words which have been so loosely used in connection with tubercles, namely, scrofula and struma, that it is necessary, at the outset, to define them.

Scrofula is the literal Latin translation of the Greek chœras, which is found in Hippocrates. Both expressions signify a young pig (scrofa, κοιρος). The older writers derive the name from the fact that the swellings are as numerous as a sow's young; or that swine suffer from this disease; or that swine have necks containing many glands; or that an affected neck assumes the shape of a swine's. The Latin word, however, was little used by the ancients, and the expression "scrofula" has only been generally used since the time of Cullen and Hufeland.

The word struma is found in translations of Greek authors, and in Celsus, as a parallel expression to scrofula, often with exactly the same meaning. This original use of the two words as synonyms has been reproduced by modern English writers, who express by "strumous" what continental writers call "scrofulous," or "tuberculous." French writers use the word struma very little. German authors, on the other hand, express by struma, tumours connected with the lymphatic glands. This use of the words will be here retained. Scrofula, however, is here used to express not a mere swelling of the lymphatic glands, but a peculiar condition of the constitution, which

causes the lymphatic glands to be unusually vulnerable to any irritating cause, and indisposed to healthy reparative action. This condition can be explained in part by an unusually rich development of the lymphatic organization, in part by a weakness of particular parts or regions. This weakness is caused by a certain imperfection in the organization of the glands. Such a constitution may be hereditary, or may be produced by insufficient and bad nourishment, foul air, &c.

The word tubercle had originally nothing to do with any special process, but merely expressed the shape of some particular local growth, or was even used as a synonym for processes of the bones. So it was applied to tumours of the most diverse natures, syphilitic, cancerous, bony, and fibrous, as a simple descriptive term. The word first began to be used in its modern sense at the end of the last, and the beginning of the present century, at the time when more accurate anatomical investigations of lung diseases, especially by Baillie and Bayle, were undertaken.

Careful *post-mortem* examinations of morbid lungs revealed a variety of conditions, which were called by various names: tubercula, struma, scirrhoma, steatomata. Two forms of phthisis were distinguished, one resulting from pneumonia and catarrh, the other from tubercles. The tubercles were considered to be diseased glands. Attention was called to the many points of resemblance between tubercles of the lungs and scrofulous glands, and hence was involved the doctrine of the identity of scrofula and tuberculosis, a doctrine held by Von Swieton, Morgagni, Cullen, Portal, and Hufeland.

The exclusive examinations of the lungs, however, and the regarding them as a standard of tuberculosis, led to confusion. Launec, especially, investigating as a specialist, and considering phthisis as a unity, confounded together a number of totally different conditions, and his great authority has influenced nearly all subsequent investigations. His followers held the cheesy material as the diagnostic sign of tubercles. Even those who, like Lebert, declared against the identity of scrofula and tubercles, considered the cheesy condition of the glands as a diagnostic sign of a tuberculous process. This cheesy material has been the source of numberless errors. It must be borne in mind that it is no specific material, but is simply dead tissue, and may be the last stage of various morbid processes. Any reasonings which regard this dead material as the essential part of tubercles must end in error. Thus, Broussais and Cruveilhier, considered tubercles as the result of an inflammatory process, and originated the doctrine of tuberculous inflammation. It is absolutely necessary to hold fast the non-identity of the original processes, and to overlook the identity of the metamorphosis which the tissues can undergo. Then it becomes possible to make the essential distinction that tuberculosis, in opposition to scrofula, is the production of heteroplastic lymphoid new growths in regions where they do not belong.

The true tubercle has no essential connection with inflammation. Whether its growth is, or is not, attended by inflammatory process, its character remains the same. It is, however, undoubtedly of an irritative nature, and it is even right to speak of a tuberculous inflammation.

Though tubercles are to be considered to be as distinct from scrofula, it is necessary to admit their near relationship. Tuberculosis may even be regarded as an heteroplastic scrofula, for the frequent occurrence of both conditions in the same person is otherwise difficult to explain.

There have been various views in regard to the relation between tubercles and the products of inflammation. First, that tubercles are the irritating cause which produce the inflammation. Second, that both tubercles and inflammatory products are formed from a simultaneous exudation. Third, that tubercles are produced from the inflammatory products. The first and last of these views are founded on fact, and can be proved by observation. The second view, that of a tuberculous exudation, was originated by Magendie, and supported by Rokitansky and the Vienna school. They held that the specific material was exuded from a morbid blood, and cited the existence of the well-known cheesy material in the alveoli of the lungs as proof. The result of their reasoning and mode of

investigation was that the real tubercles of the lung were overlooked. And under the name of gray granulations, in the lung and arachnoid membrane, they have been described by Robin as something new and distinct.

It is in the lungs that the cheesy material has caused the greatest confusion of ideas. After a chronic pneumonia or bronchitis, the alveoli and small bronchi are left filled with the products of inflammation. These thicken, degenerate, and become cheesy; there results what has, since Laennec, been called "tubercular infiltration," but is really a cheesy hepatization. This cheesy material may be found in miliary form, in circumscribed deposits, or involving entire lobes. True tubercles of the lungs arise always in the walls of the air passages, and are not secreted in their cavities.

To avoid confusion, it must be remembered that tubercles exist in various stages of growth and decay, and vary somewhat in different organs. A description, therefore, true of one stage, may be quite false of the others.

The true tubercle is organized, if not vascular; that is, it is composed of living cells. It arises from connective tissue, bone, fat, or marrow. It is, therefore, best studied in those parts which are composed of the simplest tissues, such as serous and false membranes; next, in glands, with a well-defined stroma, as the liver and kidney; with the greatest difficulty in organs, like the lung and brain, of a complex structure.

The young growth looks at first like fresh granulation tissue; it contains very soft, fragile cells and nuclei. These cells are the true tubercle corpuscle, which is not a mere nucleus nor a solid body. They resemble essentially the lymphatic gland cells, are round, and vary in size from a little smaller to threefold that of a white blood corpuscle. The cell body is colourless, transparent, a little granular, and easily broken by pressure or the addition of water and reagents. The nuclei are small, homogeneous, shining, containing nucleoli, and number from one to twelve in a cell. Between these cells is a small, net-like arrangement of connective tissues, fibres, and sometimes vessels. The latter are usually not new, but belong to the old vessels of the part.

Lebert's tubercle corpuscle is no original element, but a production formed from cheesy metamorphosis. It can be found not only in dead tubercles, but in pus, scrofulous glands, cheesy hepatization, and carcinoma, after they have undergone the cheesy transformation. It has, therefore, no diagnostic worth whatever.

The young tubercle is a true neoplasm—arises not from an exudation, but from proliferation of existing tissues, or from newly formed connective tissue.

The cellular arrangement of tubercles is repeated in all parts where they reach their acme. But in many regions the acme is never reached, especially in firm, fibrous tissues, and newly formed connective tissues. Here a large part of the tubercular tumour consists of thick connective tissue, whose cells are numerous and contain several nuclei, while only in the centre is a riper growth found. When such a tumour becomes older, nothing will be found but a fatty, granular centre and a shell of connective tissue—no cells.

After the first development of tubercles, their regular course is to the cheesy transformation. but fatty degeneration, with or without resolution, may also take place. The cheesy transformation begins at the oldest part of the deposit, generally the centre. After the cheesy stage, comes that of softening, which also first attacks the oldest portion. In tubercles growing on surfaces, however, the oldest portion is the middle of the surface, and not that of the entire growth. Those who suppose softening begins at the periphery have only observed conglomerate masses, or non-tubercular cheesy deposits. The softening is not the result of the tubercular mass causing inflammation and suppuration of the surrounding tissues. It is a purely chemical process, unconnected with suppuration. The débris of tissue, which form the cheesy mass, separate into smaller and smaller elements, and may even change to a fluid form.

If the softened tubercles are near the surface, as in mucous membranes, there follows ulceration. This takes place through the simple separation of

the softened mass, without any suppuration. But as the softening is usually only partial, the bottom and walls of the ulcer are still formed of cheesy material, which gradually also softens and separates, until there is left an ulcer no longer tuberculous, though caused by tubercles. Not until it has thus become a simple ulcer does it secrete pus. These ulcers can be best studied in the bladder. After the separation of the tuberculous matter, the ulcer may cicatrize, but this is seldom the case. More often new growths form around and under the ulcer, and the morbid process is constantly beginning afresh. The so-called infiltration is formed when a number of deposits are situated near each other. Through their confluence is formed a continuous, homogeneous, cheesy conglomerate. In mucous and serous membranes, through such a confluence of miliary tubercles results a thick, yellowish white, dry layer, which covers the entire surface, like a diphtheritic membrane. If this takes place in the walls of a tube like the bronchi or ureters, it may even obliterate their canals; and if the mass afterwards softens, it will appear like an exudation in the cavity of the tubes.

Large tubercular masses are best studied in the brain and spinal cord. There it can be seen that the mass is formed of lamellæ, and that the growth takes place by the apposition of new gray tubercles, and not of cheesy material.

In the lymphatic glands, there exists a tubercular growth arising from their connective tissue. The glands usually inflame and hypertrophy at the same time. The growth begins as small, grayish spots, in greater or less number, but does not always affect the entire gland. The gland tissue proper becomes soft, reddish gray, and succulent. The gray spots become larger, firmer, harder—and, finally, cheesy. Afterwards the mass may soften. Tuberculosis of the glands is nearly always secondary to that of neighbouring organs.

The spleen is one of the favourite seats of tuberculosis. On the other hand, the tonsils, the salivary glands, the pancreas, the muscular system, except the heart, the thyroid gland, the mammary glands, and the ovaries, show an unaccountable indisposition to take on this process.

The testicles are strongly predisposed to tubercle. The existence of syphilitic growths and of chronic inflammatory processes renders their diagnosis obscure. The anatomical diagnosis of the inflammatory process is not difficult. The gummy tumours are to be distinguished by their situation in the body of the testicle near the tunica albuginea, while tubercles usually begin in the epididymis. The tubercles always rise from the connective tissue, and never from the epithelium.

In bones, tuberculosis usually arises from the marrow, especially in the spongy bones. The vertebræ and the ends of the long bones are its favourite seat. The process usually takes the form of an osteo-myelitis tuberculosa, though in young children a simple formation of tubercles occurs. The yellow marrow first becomes red, then are formed small, grayish granulations, at first scattered, later, grouped together. The surrounding marrow is hyperæmic. Later, these granulations become cheesy, run together, and there result opaque, yellow masses, which contain the detritus of the surrounding tissues. These partly cellular, partly dead masses fill the medullary cavities. At the same time the bones thicken. After a certain time the bone tissue itself is affected, and this may take place in two ways. First the bone tissue changes into soft granulation tissue, in which miliary tubercles grow; or, secondly, the bone surrounding the cheesy masses necroses, especially in the spongy bones. There results a form of caries. Around such dead portions of bone arises a secondary inflammation and suppuration; hence are formed abscesses, which seek the surface by fistulous openings.

In Pott's disease of the spine, the cause may be either such a tubercular process, or more often a true inflammation and suppuration of the bone—osteo-myelitis scrofulosa.

If we now consider tuberculosis as a whole, we will notice two characteristics: its heteroplastic formation, and its inclination to multiple eruptions. these qualities seem to imply a dyscrasic cause, and the doctrine of a ular dyscrasis, or diathesis, has been widely taught and believed.

Hence, also, arose the question as to the exclusion and combination of tubercles with other diseases. It may be safely asserted that there is no exclusion of tubercle against other diseases, only against certain organs and tissues. But it never forms part of a mixed tumour. This question loses its interest when tubercle is considered, not as an exudation, but as a new growth.

But now we must ask, whence and how does this growth arise?

It can be definitely stated that connective tissue and its allies are always the matrix. The attempts at determining the cause of the new growth by experiments on animals have proved very unsatisfactory. It is doubtful if true tubercles even exist in them. No one has yet succeeded in forming tubercles by experiment.

There is certainly a local vulnerability and a little immunity of organs. In general, organs normally containing lymphatic elements are those most predisposed to the disease, but there are exceptions which cannot be explained. Also there is a vulnerability and immunity of individuals.

Tubercles are a disease of extra-uterine life; they are hereditary, but not congenital—hereditary not as a disease, but as a disposition. It is probable that not only tubercles, but also syphilis, scrofula, and other diseases of parents may cause a predisposition in their children.

The tissues are the carriers of this predisposition, and the younger they are so much more easily is their disposition excited. A disposition to tuberculosis indicates always a disposition to inflammation. Childhood and youth are especially prone to the disease. The fact that in the same family one child is attacked by tubercular arachnitis, another by tubercular osteo-myelitis, a third by tubercular laryngitis, does not prove the existence of a dyscrasis, which breaks out now in one organ, now in another. It rather shows that different exciting causes affect different regions, all having the same predisposition. The predisposition is not only hereditary, but is produced by all causes which debilitate the general system.

Tubercle resembles malignant growths, in that it infects neighbouring tissues. Thus, in mucous membranes and in other organs, the original growth causes the formation of new growth in its neighbourhood. There is also found a secondary tuberculosis of the glands, as in the mesenteric glands after intestinal tuberculosis, and in the bronchial glands after tubercular bronchitis. Metastases in distant organs, also, are produced.

The contagiousness of tubercles or their inoculability has not yet been demonstrated.

It seems probable that tubercles may be at times epidemic. It may be that, as with plants, so with tumours, certain seasons of the year produce an increased growth. These questions require further study.

The indications of treatment are: When possible, extirpate the tuberculous mass early, as in the testicle, the glands, the bones, and joints. When this is not possible, we must, first, fight against the predisposition by every means which will improve the general health; and, secondly, carefully avoid all irritating causes, for a slight catarrh or inflammation of no moment in a healthy constitution, in one disposed to tubercles brings a new growth in its train.—*Medical Mirror, July*, 1866, *p.* 392.

18.—ON THE HYGIENIC TREATMENT OF PULMONARY CONSUMPTION.

By Dr. J. Henry Bennet.

[There can be no doubt that the deposit or exudation of tubercle in the tissues, which in the lungs constitutes phthisis, is the result of defective nutrition, consequent on defective vitality inherited or acquired. Consequently, the rules for treatment become to some extent self-evident; they must be found principally in the strict observance of the laws of hygiene.]

The laws of hygiene may be considered to embody the conditions, bodily,

social, and mental, which are the most favourable to the healthy development of the human economy, the most conducive to its well-being. These conditions have only been clearly elucidated by modern research, and are daily ignored and infringed by the immense majority of the human race—with comparative impunity by the strong, the vigorously constituted, but not so by the weak, by those who are born with defective vitality, or are living in unhygienic conditions. In both cases, existences which, although weak, might have reached the ordinary term of human life under favourable conditions, are prematurely brought to a close.

Bodily hygiene includes principally good and abundant food, pure air, a clean skin, and exercise. Theoretically, the injunction to scrupulously attend to these points seems so rational in a disease of debility that it appears scarcely necessary to lay stress upon them; but practically it is not so. A large proportion of the medical profession, instead of looking upon the progressive deposit of tubercle in the lung, with its gradual softening, upon the hemorrhages, and the bronchial and laryngeal affections which it occasions or which precede it, as mere local symptoms of a general diathesis, have their attention arrested by the local condition. They exaggerate its inflammatory nature, and dare not apply to their patients the ordinary rules of hygiene; they dare not give wine and plenty of animal food; they dare not give fresh cool air day and night; and they dare not keep the skin clean and cool by cold or tepid sponging. Yet this timidity is a fatal mistake, for these are the principal means by which nutrition is to be improved and restored to a normal condition, and consequently by which the disease is to be arrested and cured.

The food taken by consumptive patients should be of the most nourishing kind—meat, fish, fowl, eggs, milk, bread,—well cooked, and abundant in quantity. Indeed, the quantity of food taken should merely be limited by their digestive powers. In my opinion, the principal value of medical treatment in phthisis is in the restoration of digestive tone when impaired or absent. If patients can be brought to eat, to digest, and to assimilate, they have a chance of recovery. If they cannot, their chance is indeed slight.

The medical attendant, however, must never forget the important fact which I developed at length in my work on "Nutrition in Health and Disease," published in 1856—viz., that there are two great types of digestive power, the quick and the slow. In many persons, in most indeed, the digestive process is rapid. Such individuals require food often—three, four, or more times in the twenty-four hours, and in that period they can take and digest animal food two or three times. If they have not frequent meals they feel faint and ill. The other class digest more slowly, more laboriously. They can only take food with advantage and comfort to themselves twice, or at the most three times, in the twenty-four hours, and only one meal must be a meat meal. Such individuals become dyspeptic if they try to assume the habits of those who require more frequent meals. The real remedy for their dyspepsia is not physic, but the adoption of a dietary more suited to their constitution. These peculiarities remain in disease, and must be attended to if the patient is to do well. There is no rule but the patient's own individual constitution. It is worthy of remark that the people who make two or three meals only, evidently get more out of their food than those with quicker digestion, and consequently can do well with less food.

A moderate amount of wine, as a tonic and gentle stimulant to digestion, I consider beneficial—say six or eight ounces; that is, three or four glasses of claret, burgundy, hock, or two of sherry, taken with meals, and diluted with water; or a glass or two of bitter beer if the stomach can bear it. Of late years, in America, whiskey has been much lauded as a cure for consumption, on what rational ground I am really at a loss to conceive. I have seen a certain number of cases in which it had been long taken, but I cannot say with benefit. The daily ingestion of large quantities of nerve-stimulating spirit certainly does not come under my notion of hygienic treatment. Carbonaceous food can be given to all but any extent in a more natural and less pernicious form.

It seems also, at first sight, as superfluous to state that in a disease of debility like pulmonary consumption patients should breathe pure air as that they should live on nourishing food; but it is not so. Theoretically the value of pure air—of atmospheric food—is universally accepted by the medical profession; practically it is all but universally neglected. The physiology of respiration—a modern discovery—has yet to be applied, not only in every-day life, but even in the treatment of disease. Most medical men as well as their patients ignore the all-important fact that the demands of respiration are so great that one or two human beings soon use up and contaminate the air contained in a good-sized room. Such being undeniably the case, unless it is renewed artificially, or by an open window or door; in other words, unless the air in an inhabited room is constantly undergoing change, impure air is ever breathed—air calculated to produce disease in the healthy, and to increase it in the sick. So universal is the neglect of this fundamental law of health, that the healthy persons who do not sleep in rooms with the windows, doors, and register stoves shut, and who do not thereby poison their blood all night with their own excreta, are as yet quite the exception. In ill health, and especially in diseases of the respiratory organs, the dictates of science and of common sense are still more grossly outraged. At a time when, perhaps, the principal food the economy can take is pure air; when the diseased lungs, partly inefficient, require the purest and best air food that can be afforded them, the doors and windows are generally kept shut on pretence of chills, cold air, and draughts, a due supply of respirable air being thus refused to the unfortunate patient.

Attention to the functions of the skin is, I consider, next in importance to attention to food and air—that is, to digestion and to respiratory nutrition. The skin has very important eliminatory functions to perform. It is by excretion through its pores that the economy partly throws off the effete or used-up carbonaceous and nitrogenous elements of the system. This is illustrated by the strong odour of the cutaneous secretion when not washed off. Moreover, the skin and the lungs seem to partly replace each other in this work of excretory purification. In warm summer weather the skin and liver act freely, and the lungs and kidneys are comparatively at rest. In the cold damp weather of winter the pores of the skin are closed, and it rests, the lungs and kidneys taking up the excretory process. Thence probably the feverish colds of damp cold weather. The blood is poisoned with the elements that the closed pores of the skin should have eliminated, which occasions the fever; whilst the lungs often succumb to the increased duties they have to perform, and inflammatory affections supervene. Whatever the explanation, the fact is certain, and it is now well established that the best mode of preserving the respiratory organs from winter colds is to keep the pores of the skin open by the use of cold or tepid water, combined with friction; or, in other words, to keep the cutaneous excretions up to their normal standard.

Acting in accordance with this view, I make all my consumptive patients, whatever their condition, if they have the strength, use a sponge-bath at the temperature of from 64° to 68° daily, and with the greatest possible benefit. I neither have to contend with hemorrhage or chills, nor with aggravation of the cough, but quite the contrary. The cold sponge-bath produces in nearly every instance a feeling of indescribable comfort, and lowers the pulse. The contact of the cold water may accelerate the expectoration of the muco-pus collected during the night in the bronchial tubes, but that never alarms when it is explained that such is a result naturally to be expected. I myself derived the greatest possible comfort and benefit from cold sponging in summer in the open air on the banks of a Scotch loch, the waters of which were at 60°; and that when I was very ill, pulse 100, and skin hot and feverish. This gave me a confidence I have never lost, and of which I have never had reason to repent.

The question of exercise is an important one, and one that requires discussion and elucidation. I would say at once that, from personal experience and observation, I believe it is a great mistake for consumptive patients to

take much active exercise. Every winter I see some such patients walk themselves to death. They have been told by their medical attendants at home to take exercise, and they do so, thinking that what gave them an appetite, and did them good when well, will do so now they are ill; but they merely walk themselves into their graves. The disease from which they are suffering is one of debility. The strength of former days has gone out of the youth and of the man, although perhaps he knows it not. Or the strength he has is fictitious, unreal strength, the result of a febrile condition, of a state of morbid nervous excitement. So he walks up hill and down dale, loses his appetite, cannot eat, becomes "bilious," is dosed for liver, and the disease progresses rapidly. Every winter, towards January or February, some invalids consult me who have up to that time taken their case in their own hands, and have thus walked from breakfast to dinner, with the healthy, in order to gain strength. But they have lost it instead—have become paler and thinner; and when I see them, I find that they have lost ground, that the disease has gained upon them since they arrived in the autumn, and that they are decidedly worse—all from over-exercise.

The sound rule for a consumptive patient is to take passive exercise, not active; to ride in an open carriage; to be rowed in a boat; to sit and lie hours in the open air; to live with windows open, but never to incur great muscular exertion. The amount of vital power in such cases is small. If it is too freely expended in exercise, there is not enough left for normal digestion; food is imperfectly assimilated, nutrition is defective, and the disease progresses.

A singular, but explicable fact is, that during the existence of active disease, when tubercles are forming and softening, very often no lassitude is felt on exertion. But when the disease is arrested, and a curative process has been set up, extreme debility and lassitude may be experienced and complained of, lasting for months, or even years. I felt this lassitude for five years. The explanation is simple. As I have already stated, in active disease there may be a false, feverish strength, like that of the delirious patient whom it takes half a dozen men to hold. In the curative stage, the false strength is gone; the real condition of the patient comes to light, as it does with the delirious patient when the delirium is gone, and he can scarcely lift his hand from the bed.

The social and mental hygienic condition favourable to the treatment of consumption may be summed up in a few words—Rest, repose, the absence of the ordinary duties, cares, harass, and worries, of life. To obtain these is difficult in the social medium in which the disease has appeared. Therefore, the duties and obligations of life should be surrendered for a time, if possible; modified, diminished, if not. Those, however, have the best chance of arresting the progress of disease who can escape from the social medium in which it appeared. To do this it is always necessary to make great sacrifices—sacrifices which many cannot make. But those who can must remember that the struggle is one not merely for a higher or lower stage of health, but for life itself.—*Lancet, Sept.* 29, 1866, *p.* 350.

19.—RAW FLESH AND BRANDY IN THE TREATMENT OF PHTHISIS.

The method of treating consumptive diseases by raw meat and alcohol appears, according to M. Fuster's statements, to have been attended with wonderful results. It has now been tried in no less than 2000 cases, and in nearly all successfully. The patients increase in weight to the extent of two, three, four, or six kilogrammes in the course of two or three weeks. M. Fuster recommends the adoption of his treatment for the following maladies:—Advanced anæmia, the last stages of ague, typhus and typhoid, leucocythæmia, albuminuria, and diabetes, and also in cases where there has been great loss of blood or seminal fluid.—*Lancet, July* 21, 1866, *p.* 70.

20.—ON THE INFLUENCE OF SEX AND AGE IN DETERMINING THE LIABILITY TO ASTHMA.

By Dr. HYDE SALTER, F. R. S., Physician to Charing Cross Hospital.

[Since the publication of Dr. Salter's work on asthma, he has preserved very copious notes of a hundred and fifty cases of the disease.]

The first point on which my notes furnish information is *Sex*. In my work on asthma, I have stated that men are more liable to it than women in the proportion of two to one. My subsequent experience has been a remarkable confirmation of this estimate. Of 153 cases, 51 I find are females, and 102 males, which is exactly two to one. This is too striking and uniform a proportion, and my numbers are now too large, for it to be fortuitous. Why, then, one cannot help asking oneself, are men twice as liable to asthma as women? The answer to this question—the only possible answer—is one bearing directly upon our notions of the etiology of the disease; it must be because the causes of asthma are such as men are more exposed to than women. The different views that have been entertained with regard to the etiology of asthma fall under two principal heads—one, that asthma has a local cause in the lungs; the other, that it depends on a fault in the general nervous system. That that sex which is the most exposed to the vicissitudes and inclemencies of the weather—wet, cold, and night-work—should be twice as liable to asthma as the other, tells strongly in favour, as far as it goes, of the former of these views; for the agencies to which men are exposed, in contradistinction to women, are exactly those which tend to give rise to inflammatory conditions of the respiratory mucous membrane.

I have noticed another striking fact with regard to sex quite consistent with this. Twenty-three of my patients were between twenty and thirty years of age; of these 9 were males, and 14 were females. Between fifty and sixty years of age I had 19 patients; of these 16 were males, and 3 were females. Thus at the period of life at which the lungs are the least likely to be organically affected, but at which the nervous system is more excitable, the females greatly exceed the males—in the proportion of 3 to 2; while at the time of life when organic disease of the lungs is likely to exist, the males greatly exceed the females—in the proportion of 5 to 1.

Age.—In relation to age, my notes give information on three points—the age of the patient at the time of my taking the notes; the age at which the disease first made its appearance; and, as a result of these two, the length of time the disease has existed.

The first point, the age of the patient, is not an important one, and has very little direct instructiveness. My cases merely show that asthma comes under the physician's care at every period of life, and that the largest number of cases are in what may be called middle life—from twenty to fifty. There are more asthmatics of ages between thirty and forty than any other equal period. On each side of these ages—before thirty and after forty—the numbers fall.

A much more interesting and important point is the time of life at which asthma makes its appearance. On this point my cases show the following facts:—That, dividing life into equal intervals of ten years, a larger number of cases take their commencement in the first ten years of life than in any subsequent equal period; that childhood is of all ages the most prolific of asthma. After childhood there is a sudden fall; during adolescence much fewer cases declare themselves. But from this there is a gradual rise up to forty. Thus, the number of cases in which the disease commenced between ten and twenty was 20; between twenty and thirty, 23; and between thirty and forty, 27. From forty to seventy again there is a regular but rapid fall. Thus the number of cases commencing between forty and fifty was 16; between fifty and sixty, 9; and between sixty and seventy, 3. We should naturally expect that the time of life at which asthma was apt to show itself would be closely connected with the causation of the disease; and so I think it is. For I arrive, from the foregoing figures, at the following conclusions:—

1st. That the time of life the most prolific of asthma is the time of measles, of whooping-cough, and of infantile bronchitis.

2nd. That adolescence furnishes comparatively few cases, because the diseases of childhood, so apt to lay the foundation of it, are over, while the wear and tear and hardships of life, and the deterioration of the body produced by them and by time, have not commenced.

3rd. That from this time exposure and hardship and time begin to tell, and show their influence by the increasing asthma-rate reaching its maximum at middle life. But, it may be asked, why should the tendency for asthma to show itself increase up to forty, and then diminish? Why should it not go on increasing as life advances, especially as we know that the tendency of catarrhal and other agencies to produce inflammatory conditions of the respiratory mucous membrane does increase up to the very end of life?

This brings me to the fourth point, which is this: That this diminishing probability of asthma making its first appearance after middle life shows that it does not follow the same law as bronchitis, and that there is something necessary for its development besides vascular change in the bronchial tubes and other organic lung mischief. The other thing is doubtless the asthmatic tendency or idiosyncrasy; and the way in which the necessity of the asthmatic idiosyncrasy for the production of the disease accounts for the diminishing probability, as life advances, of its making its first appearance is this: As every year is added, an individual is decreasingly likely to be exposed *for the first time* to the exciting cause of the disease; if any one has the predisposing cause—the asthmatic tendency—within him, it is not likely he will travel far through life, without the exciting cause presenting itself and bringing the disease into activity, and those only can reach advanced life, without becoming asthmatic, in whom either the asthmatic tendency is *nil* or feeble, or who have fortuitously escaped circumstances calculated to call it into activity. Such a number must, according to the doctrine of chances, be a constantly decreasing series. The diminishing number of cases is, in fact, an exact measure of the diminishing probability of a person with the asthmatic tendency postponing his first exposure to exciting causes to so late a date.

There is nothing in relation to asthma about which more misconception prevails than the time of life at which it is apt to occur. It is commonly thought to be a disease of old age, and we frequently hear the expression "as asthmatic as an old man." I believe there are two reasons for this error. One, that asthma, if it is not lost comparatively early in life, or if it comes on in middle life, is generally never lost, and therefore exists in old age; and thus many old people are truly asthmatic simply because they have never ceased to be so. The other reason is that chronic bronchitis—undoubtedly a disease of advanced life—is often mistaken for asthma; an old man coughs and wheezes and spits, and is said to have the asthma; but he has really chronic bronchitis; and although the bronchitis may have a little bronchial spasm superadded to it, or even a great deal, still it is essentially and substantively bronchitis.

The error of imagining that asthma is not a disease of early life is one into which, as I have shown, even medical authorities have fallen. But my cases furnish abundant evidence that asthma may, and frequently does, occur very early in life; that there is no time of life that is free from it; and that it may occur even in infancy. A striking example came under my notice a few weeks ago. I was sent for by my friend Dr. Martyn, of Knightsbridge, to see a patient in consultation with him. I found a child in its mother's arms apparently strangling. The child was livid, and its efforts to get air were so violent, and at the same time so ineffectual, that it did not seem as if the struggle could be long continued. Yet its parents told me that it had been in this state, on and off, for six weeks, the wheezing being sometimes so loud that it could be heard from one end of the house to the other; and, what was more strange, while I was looking at the child, and watching its violent efforts, it made signs that it wanted certain toys to amuse itself with, and actually did amuse itself with them in the midst of such struggles for breath—a sure sign that it had become accustomed to them. From the choking

character of the dyspnœa, and the way in which the child threw its head back, I fancied at first that the spasm must be laryngeal; but the examination of the chest and the history of the case showed that the bronchial tubes were the principal state of the difficulty, though I am inclined to think there was at times laryngeal spasm as well. While I was watching the child, and wondering how it could amuse itself with its toys in such a state, the difficulty of breathing began to abate, and in five minutes there was hardly a trace of it. This, its parents told me, would often be the case. Now there could be no doubt that we had here a case of genuine spasmodic asthma in a child of fifteen months old—indeed the child was only thirteen months and a half old when its symptoms commenced.

Exactly one quarter of my cases (38 out of 153) occurred under ten years of age, and, of these, five were under eighteen months. In four-fifths of the entire number the disease appeared under forty years of age. The most advanced age in which it appeared was sixty-nine—I had one patient of seventy who had only had it a year.

Length of standing.—The longest time that asthma had existed in any of my cases was sixty-four years. This period had been reached in two instances; in one case the patient's age was sixty-nine, and he had become asthmatic at five; the other was seventy years old, and the asthma began at six.

There is no rule that the oldest cases have had the asthma the longest or the youngest the shortest time. Cases of the same age will have had their asthma very different times, while cases of equal standing will be found at various ages. Thus two of my cases aged seventy years had had their asthma one a year and one sixty-four years; while a third of the same age had had it just half his life, or thirty-five years. Again, two of my cases of equal standing, both having had asthma twelve years, were one aged sixty-nine, and the other fifteen—one an old man and the other a young girl—yet their asthmatic age was the same. In this way there is every variety—no rule. Twenty-seven of my cases were of upwards of twenty years' standing, and of these, two had suffered from asthma thirty-four years, two thirty-five years, one thirty-seven, one thirty-nine, one forty-three, two forty-five, one fifty-three, and two sixty-four. Such numbers as these show how little tendency the disease has to shorten life.—*Lancet, July* 28, 1866, *p.* 90.

21.—ON THE IMMEDIATE EXCITANTS OF THE ASTHMATIC PAROXYSM.

By Dr. Hyde Salter, F. R. S., &c.

In considering the causes of asthma, it is necessary to bear in mind the broad distinction between the causes of the disease and the causes of the *paroxysms*. Sometimes these two are the same—that which has laid the foundation of the disease will produce the subsequent attacks. Thus asthma often takes its origin in bronchitis, and whenever bronchitis subsequently occurs it brings an attack of asthma with it. But much more frequently the cause of the disease and the causes of the paroxysms have nothing to do with one another, are quite distinct; that which produces the disease not producing the paroxysms, and that which produces the paroxysms not producing the disease. Thus measles may have laid the foundation of the disease, but it never occurs again to produce the paroxysms; on the other hand, the presence of ipecacuanha powder in the respired air may produce the paroxysm, but it could not produce the asthmatic tendency.

The provocatives of the asthmatic paroxysm may be divided into those which are applied to the air-tubes themselves (or, at any rate, those which affect them primarily), and those which are applied to some remote part, and affect the air-tubes secondarily. These last always reach the bronchial tubes by a nervous circuit—ganglionic or cerebro-spinal.

Those which are applied directly to the bronchial tubes, or affect them primarily, are of three very distinct kinds; *a*, things inhaled; *b*, an inflam-

matory and therefore morbidly irritable condition of the bronchial mucous membrane; *c*, the presence of a blood that, not necessarily morbid, nevertheless, in the particular pulmonary system of the asthmatic, constitutes a source of irritation; as, for example, what we may call the *sanguis cibi*—the blood after a meal.

Those irritants which produce asthma by acting on some remote part may either be such as are applied to the *peripheræ* of the nervous system—e.g., an indigestible meal, a loaded rectum; or such as affect the brain itself; and these last may either be physical in their nature—some morbid condition of brain—or psychical.

My notes furnish examples of all these provocatives of asthma, some of which are very curious.

In the majority of cases the provocatives of the attacks belong to more than one class; it is the exception to find that *only* local irritants, or *only* psychical causes, or *only* sources of reflex irritation, may give rise to the fits. We commonly find in each case such lists as these; "the effluvium of hay, a late supper, the catamenial period;" or "mental excitement, nuts, fog;" or "thundering weather, wine, the smell of a lucifer match;" in which examples the irritants belong to entirely different groups—one nervous, one bronchial, one peptic. And I think that this fact is not without its indicativeness; I think it shows that the asthmatic tendency consists, in its essence, in a *general* and not a *special* irritability of the nervous system—not in an idiosyncrasy that resents this or that particular thing, but in a general tendency to be irritated.

There are many excitants of asthma whose *modus operandi* is not very clear, and with regard to which the questions at once arise in the mind—How do they act? To what class do they belong? Let me endeavour to answer these questions with regard to some of those doubtful irritants, and then it will be seen hereafter why I assign them the place among the provocatives of asthma I do.

How does *cold* act? I believe in three ways. 1st. As a local irritant, just as damp or fog acts, the cold inspired air at once producing the bronchial spasm. 2nd. As a stimulant to the cutaneous surface, acting reflexly *viâ* the centripetal spinal nerves. In no other way do I conceive we can explain the *immediate* production of asthma by cold to the feet, &c. 3rd. By producing catarrhal bronchitis. In the first two cases the cold acts at once; in the last remotely, not perhaps for days. In the first two a certain amount of cold inevitably produces the asthma; in the last it entirely depends on whether it gives rise to "a cold;" if not, the greatest depression of temperature may be endured without the slightest injury.

How do *heat* and *thunder* act? I believe by producing greater general irritability of the nervous system, and making it more sensitive to sources of disturbance of any kind whatever.

How does *over-exertion* act? In two ways, I think. 1st. By taxing the respiratory organs, and generating a certain amount of respiratory arrears, and consequently of pulmonary congestion; and perhaps by the rapid passage of fresh and cold air over the bronchial mucous membrane. 2nd. By producing nervous excitement and exhaustion. In which of these two ways it acts in any given case is shown by the time in which the result takes place; when the over-exertion produces the asthma at once it acts in the two former ways, or both; but when the asthma does not occur till some time after—as, for example, when an asthmatic boy always has an attack *the day after* a cricket match,—it is only in the last way it can act.

How does *laughing* produce asthma? There is no doubt of the fact that it *does* so in a great many cases. In at least a dozen instances patients have spontaneously told me that laughing is always dangerous to them; and I have known several cases of hay fever in which, although the individuals could laugh with impunity at other times, yet during the hay season they never dared laugh lest it should make them asthmatic. I believe it possesses this tendency by producing a condition of extreme expiration. There is no doubt that this favours asthma. I have known many patients who

could always make themselves decidedly asthmatic (when the thing was hanging about them) by making two or three prolonged expirations, and emptying the chest of air; the same kind of thing that a person does when you tell him to wheeze. Why is this so? Why should prolonged expiration favour asthmatic contraction of the air-tubes? I suppose it is on the same principle that a very deep inspiration will break through and destroy it—a fact which I have heard affirmed by a hay asthmatic: I suppose it is that the expiration, relieving the tube of the distending traction of the expanded lung, *allows* it to contract, ceases to oppose the tendency to contract, and so allows the spasm to assert itself unopposed, and get more and more complete control over the tube. Any one who has watched the act of laughing will have observed that it consists principally of a series of short expirations. But not only does laughter produce an expiratory condition of the chest, but it very much suspends respiration for the time, as is shown by the breathlessness and congestion of the face it induces. Now anything that, by suppressing respiration, produces congestion of the face, produces also congestion of the lungs; it is possible, then, that laughing may tend to produce asthma in this way also. I have thought, too, that laughing may tend to produce asthma in another way. It is an involuntary and excito-motory (though not reflex) act: may not the condition into which the nervous system is thrown in laughter tend to favour the development of excito-motory action in general?

Lastly, how do *coughing* and *sneezing* tend to throw the bronchial tubes into a state of spasm? I think by throwing the air passing through them into violent motion and vibration. This must be somewhat similar to the production of asthma by the inhalation of mechanical irritants: it is, in fact, a form of mechanical irritation. I have known talking produce asthma, and I fancy it must do so in a similar way by the irritation which the laryngeal vibrations, propagated down into the lungs, offer to the morbidly sensitive air tubes. Coughing, especially in long fits, may also act by producing pulmonary congestion.

I think this examination of the *modus operandi* of these provocatives of asthmatic spasm is worth the time and trouble spent in discussing them; for unless thus explained they possess no instructiveness and contribute nothing to the pathology of the disease.

The largest group of all is furnished by materials inhaled. These may be divided, I think, into three classes:—1, particular kinds of air; 2, chemical and mechanical irritants; 3, certain (or rather, perhaps, I should say very *uncertain*) animal and vegetable emanations.

1. *Some inappreciable quality of air.*—This, one of the commonest exciting causes of asthma, is expressed in different ways and different degrees in different cases. In some cases change of air is the great thing. This is often felt at first going to a place, and only at first; the first night or two will be asthmatic, however well the place may afterwards agree. In another class of cases asthma is sure to come on if certain specified places are visited; they may be few or many, but whenever they are visited the asthma is sure to supervene. In many of my cases the individual places which bring on the asthma are mentioned; in one it always came on an hour or two after going into the country, in another going to Malvern always brought it on, in another Hampton Court, in another Denmark-hill, in another it was Brighton, in another a particular house at Matlock.

In another set of cases change of weather, without change of place, seems sufficient to excite the asthma; even change of wind. In some of my cases the special winds are mentioned: in one it will be east wind, in another south-east, in another any high wind, in another any cold wind.

And this brings me to another class of cases, in which the great thing that induced the asthma was cold—cold frosty weather, change of temperature from one room to another, being out in the night air. But I am not sure whether the cold air produces the asthma in these cases as the respired medium, irritating the air-tubes, or in the other ways which I have already mentioned.

In other cases a close air—as in a crowded room, a church, a railway carriage—is mentioned as that particularly apt to give rise to the asthma.

2. *Chemical and mechanical irritants.*—Dust is, of all mechanical irritants, that which I think most frequently recurs in my notes. Next to that comes smoke; the burning of a lucifer match would in many cases always bring on an attack. In one gentleman the smell of camphor would always bring on asthma, and in another the smell of sulphur. In another case stifling gases of any kind. One lady always had her symptoms induced by the smell of paint, and another whenever a bed was made in the room where she was. Dust from hay was particularly offensive in one instance, so that the patient could never go into a hay-loft. Sneezing, speaking, and coughing must, as I have already mentioned, be considered mechanical irritants; they frequently occur in my notes.

3. *Animal and vegetable emanations.*—Perhaps the most curious, I might almost say incredible, incidents to be found in my notes, relate to the production of asthma by certain animal and vegetable emanations, especially animal. At the time of the publication of my work on asthma, I was acquainted with only two animals the effluvium from which would give rise to asthma—cats and rabbits. Since that time I have met with cases in which the effluvium from horses, wild beasts, guinea-pigs, cattle, dogs, hares, would immediately give rise to a paroxysm. One patient, the proprietor of a well-known equestrian establishment, always had his asthma brought on by the presence of his horses; consequently he was continually asthmatic. He had no suspicion of the real cause of his symptoms till he made his fortune, and retired from business, when he almost entirely lost them; but if at any time he goes back to his old haunts among the horses, his old trouble immediately shows itself. By giving up his avocation at any former time of his life he would have probably lost his disease.

I might mention many similar cases from my notes. In one the patient when a boy was never able to keep rabbits in consequence of the effluvium from their hutches always bringing on asthma when he went near them. In another, a lady was always unable to visit the Zoological Gardens without being rendered asthmatic, especially was she unable to go into the animal houses. In one case a great variety of animals had the power of giving rise to asthma—horses, rabbits, sheep, oxen, and dogs; this gentleman could never go to a horse-show or dog-show without becoming immediately asthmatic and being compelled to leave. Three of my patients belonged to a family in which this peculiarity existed for three generations, and was evidently hereditary. The grandfather was affected by cats, and could always find out by his breathing if there was one in the room. A grandson, who was also asthmatic, always had an attack brought on by the smell of guinea-pigs. A nephew could never go near horses without being rendered asthmatic, nor could he be in a room where those were who had been riding. He was a country gentleman and frequently anxious to attend agricultural meetings, but he was unable to do so from this circumstance. Another nephew told me a curious thing of himself, which, if correct, is perhaps more curious than any of the other facts. On two occasions, when staying at a friend's house in the country, he was attacked with asthma, and found in both instances that there were deer feeding at the time immediately beneath his window; on a third visit, when the deer had been removed to a distance from the house, he was quite free from any asthmatic symptoms.

One of these gentlemen told me of a friend of his, a country clergyman, who was always rendered asthmatic by the neighbourhood of a hare or hare-skin. If he met any of his parishioners on a Sunday who had been poaching and had their booty about them, he could always in this way detect them. When this gentleman was a boy, and studying with a private tutor, a friend put a hare under a sofa in a room where he was, as a practical joke; the result was an immediate and very severe attack of asthma.—*Lancet, Sept.* 8, *and Oct.* 6, 1866, *pp.* 259, 384.

DISEASES OF THE ORGANS OF DIGESTION.

22.—ON THE TREATMENT OF DIPHTHERIA.

By Dr. W. Newman.

[A direct cure is not to be looked for in diphtheritic affections any more than in the wider division of fevers. We can only hope to tide the patient over a disease more or less severe, and guide rather than to cut short the case. The one essential characteristic of well-developed cases of diphtheria is a distinct tendency to death from general failure of strength.]

From the very first onset and recognition of the affection, I would urge that the patient be kept in the recumbent position, and be spared any unnecessary exertion; that he be fed frequently rather than largely; and that the air of the room be often thoroughly changed. Do not, blindly following a mischievous routine, administer aperients; least of all, those containing mercurials. A simple injection of warm water will probably meet every requirement. Nor is it advisable to encourage perspiration by sedative or lowering medicines.

In this, as in all septic diseases, I would ask for constant circulation of fresh air through the apartment. Screen the patient from direct draught, but yet by continuous fire and open windows ensure that he shall not breathe again and again an atmosphere vitiated by his own excretions.

Medical treatment will embrace

1. *Local applications.*—So soon as the exudation is fairly manifested, and the co-existence of vivid redness of the surrounding mucous membrane points to its probably rapid increase, I hold it the best to use at once, as the most efficient application, the strong hydrochloric acid, diluted either with honey or with water, in equal bulk. A piece of sponge tied firmly on a stem of stick or whalebone, and then well saturated with the diluted acid, will be best for the application; and this once made the patient will usually declare himself much relieved. It seems to do away with the burning sensation about the fauces at the cost of a comparatively momentary pain, and furthers the curling up and detachment of the coriaceous layer. Once or twice again it may be well to resort to this potent caustic at an interval of twelve or twenty-four hours, rarely more frequently.

Then I have used as an after application the undiluted Beaufoy's solution of chlorinated soda, also used with a sponge or large brush every four or six hours.

To make any of these applications thoroughly, the tongue must be well kept down with a spatula, or drawn forward out of the mouth.

Gargles are of little value. It is true that they wash out the mouth and the anterior part of the fauces, but they do not go back to the special seat of the disease.

In those not very infrequent cases where fœtor exists from decomposition of the secretions, or from commencing sloughing, I have had recourse to a tolerably strong solution of the chloride of zinc, and I think with decided advantage; and as an addition to the patient's comfort, the per-manganate of potash (Condy's fluid), with six or seven parts of water, may be employed to cleanse the mouth from stringy saliva and offensive discharges.

In the earlier cases the nitrate of silver was used as an application, and then totally discontinued. This agent has always seemed to me inefficient as a caustic, apt to deceive the eye in subsequent examinations from the coating which is left behind after its use, and unsatisfactory in any influence for good in the removal of exudation or effect on the tissues.

Of external applications I have little to say, other than to deprecate very positively any resort to those which may remove the cuticle or damage its condition. More than once I have met with cases where, after the local use of blisters, or liniments of liq. ammoniæ, the irritated surface has been speedily

covered with the characteristic lymph exudation, but in no one instance has even temporary benefit appeared traceable to such means.

For the comfort of the patient, and indeed with some actual value, I think it well to apply an evaporating lotion of spirit of wine to the swollen and infiltrated structures beneath the jaw.

2. *Internal remedies.*—The class of internal remedies from which the most good may be hoped is that of tonics, and from many conditions which are present in severe diphtheria preference should be given to preparations of iron. These, in one form or other, I would give even from the first declaration of the disease, not waiting until increased pallor of integument and advancing debility make such agents palpably needful.

The ordinary tincture of the sesquichloride is for several reasons most to be advocated, not merely from its effects on the circulating fluid, and from its powers as a general nervous tonic, but also from its presumably good effect on the affected tissues as a direct astringent.

Again, it would seem that all compounds containing and readily parting with chlorine are of service, so the chlorate of potash may be given in conjunction with the iron; or, for the good purpose of combining in one an efficient local application, and a means of introducing chlorine readily into the system, the formula given below may be employed with advantage.

℞. Potass. chloratis ʒ ij; acid hydrochloric. ℥ ij; aq. destillat. ℥ij.

Mix the acid and water together first; add the mixture to the chlorate of potash, and keep the whole in a dark place.

ʒij. of this solution to be mixed with a pint of water.—Dose, one or two tablespoonfuls, according to age, for internal use; or as a wash for mouth or gargle.

Several of the worst cases of diphtheria which I have seen have seemed to owe their recovery to the steady use of this compound; especially one where life for days together hung by a thread, and where a huge coherent cast of the pharynx and back of the throat was expelled.

Cinchona, as a decoction or tincture, I do not think of material value; and quinine, although I have commonly given it where there has been much loss of appetite, excessive perspiration, and so forth, has seemed to carry with its use only an indirect good.

3. *Food and Stimulants.*—These play no unimportant part in the medical dealing with so serious a malady. Small quantities of nutritious and easily digestible food should be given at very short intervals; and no existence of feverish symptoms should for one moment be deemed warrant for confining a child to "low diet." I believe that, humanly speaking, very many deaths from diphtheria have resulted from inattentive nursing, and from an unwillingness to press on a listless sufferer the prescribed supplies of food.

New milk is of very much value, and may be used in large quantities, and, at intervals with this, beef tea, essence of beef, or other nutritious foods. Farinaceous compounds are least to be trusted to.

Sometimes, and indeed as if it were an integral part of the affection, there may be absolute repugnance to food; a condition, if lasting beyond some short time, which renders ultimate recovery almost impossible. Yet here even much may be done by quiet perseverance, and, failing other means, nutrient enemata should certainly be tried.

Stimulants should be used early and without hesitation; as in cases of fever, the first-noted feebleness of the heart-beat, or softness and rapidity of the pulse, furnish full reasons for their employment. Wine is probably to be preferred to other alcoholic compounds.

Accidental complications, very apt to occur, will call for changes of treatment, and a wearisome illness cannot throughout be treated by the same remedies; but the declared principles hold good that the disease is eminently asthenic in type, and that no lowering agencies are to be deemed admissible.

Extension of local mischief to the larynx may occur in the most simple cases, and certain expedients should at once be tried. Emetics (the sulphate of zinc, for example) may be given, and the child made, as in croupy attacks,

to breathe an atmosphere loaded with warm vapour, with other means which may promise relief.

If these, however, fail, tracheotomy may be suggested; in four well-marked cases I have myself done the operation, substituting thereby an easy for a most terrible death, and giving some hours more of life when life was on the point of passing away. The details of the necessary operation may be found in any surgical work. Cautiousness and slowness are the two most necessary points to be observed in performing it. Yet although I would in a suitable case propose and carry out the same procedure, it would still be with the fear that recovery would be most uncertain; not from the local throat mischief, or in any sense from the operation itself, but from the wide-spread taint of the general system. Relief may be promised with fair confidence, painless death will take the place of an agonising struggle for breath, but a very small per centage of cases ultimately do well.

Supporting treatment, enforced and long-continued rest, with change of air, form the best rules for dealing with the consequences of diphtheritic affections; loss of nerve power is but slowly repaired, and though, in the great majority of cases, recovery may be certainly expected, it is only after a very prolonged convalescence.—*St. Bartholomew's Hospital Reports, Vol. II*, 1866, *p.* 42.

23.—HYDATID OF THE LIVER, TREATED SUCCESSFULLY BY THE INJECTION OF THE EXTRACT OF MALE FERN INTO THE CYST.

By Dr. F. W. Pavy, F. R. S., Assistant Physician and Lecturer on Physiology at Guy's Hospital.

Harriet V., a woman of pretty healthy appearance, aged 21, admitted into Mary ward under the care of Dr. Pavy, Oct. 4th, 1865. When three years old she was squeezed against a wall by a cart wheel, which struck her somewhere on the right side of the chest. No rib was fractured, and she soon recovered from the accident. About six years ago the patient noticed a slight swelling in her right side, which has since continued gradually increasing in size.

On examination, a large deep-seated tumour was to be noticed occupying the right hypochondriac region, and extending considerably beyond, both above and below. Its boundary could be clearly defined inferiorly. It caused a considerable bulging of the ribs on the right side, and the right mammary gland was raised about three-quarters of an inch above the level of the left. Fluctuation was apparent. Dulness extended as high as the lower border of the second rib on the right side.

The case was diagnosed to be one of hydatid tumour of the liver. The relationship that is agreed upon by helminthologists to exist between the hydatid and the tænia, and the known effect of the extract of male fern upon the latter, suggested to the author the treatment adopted. The extract is not miscible with alcohol or water, but it was ascertained that a liquid sufficiently thin for passing through a fine canula was to be obtained by admixture with a little potash.

Nov. 6th. A fine trocar and canula were introduced into the tumour by Mr. Durham, and about four ounces of a limpid colourless fluid allowed to escape, in order to diminish the tension of the cyst. A liquid consisting of half a drachm (by measure) of the purified semi-fluid extract of male fern, half a drachm of liquor potassæ, and six drachms of water, was then injected into the sac, care being taken throughout to prevent the entrance of air. The fluid removed was examined, and found to be non-albuminous, charged with a large quantity of the chloride of sodium, and to contain hooklets of the echinococcus. At the introduction of the trocar the patient complained of experiencing a considerable amount of pain, which she referred to the lower part of the abdomen. Some febrile excitement, vomiting, and purging followed, but there was no evidence of peritonitis.

10th. On percussion it was found that dulness did not extend so high in the chest on the right side by one rib as previous to the operation.

16th. The patient was allowed to get up.

20th. The tumour was found to be much diminished in size. It was much softer, did not extend so low down in the abdomen, and was much less distinctly circumscribed. The chest was resonant on percussion as low as the space between the fourth and fifth ribs.

29th. The circumference over the most projecting part of the tumour before the operation was 34¼ inches; to-day it is 31¼ inches; showing a reduction of 2¼. Tumour very soft, and its lower border not to be defined as formerly. The patient, being well, was allowed to leave the hospital.

A fortnight and again a month afterwards she was seen, and found to be progressing satisfactorily.

May 10th, 1866. Since she was last seen the patient had suffered from an attack of rheumatic fever with heart complication, and bronchitis. She had been in no way troubled with her side, and her circumference was now thirty inches. No swelling was perceptible to the eye, but a hardness remained in the hypochondriac region.

The inference to be drawn from the result in this case is, that the injection of the extract of male fern caused an immediate destruction of the life of the hydatid without the production of suppuration, and that a rapid absorption of the fluid element of the cyst afterwards took place.—*Lancet, Sept.* 1, 1866, *p.* 234.

DISEASES OF THE URINARY ORGANS.

24.—ON PAROXYSMAL HÆMATURIA.

By Dr. F. W. Pavy, F. R. S., Assistant Physician and Lecturer on Physiology, Guy's Hospital.

[During the last two years Dr. Pavy has seen two of the cases to which he has given the above name. The first patient was a gentleman of middle age, who said that a slight exposure to cold was usually followed by the passage of urine of a more or less porter-like colour. The urine was found to be opaque from lithates, and also to contain albumen. The microscope also showed the presence of oxalate of lime octahedra. Between the attacks, beyond a deposit of crystals of lithic acid, the urine was perfectly natural.]

My patient informed me that during the last year or two he had frequently suffered from similar attacks; that he had been under different medical men, and had taken quinine and various other remedies for his complaint. It had been ascertained that there was no stone in his bladder; and it was not exercise but exposure to cold that brought on his attacks. He was comparatively free from them in the summer. There was no periodicity about their recurrence of the character belonging to ague; and he had never, as far as he knew, been the subject of that complaint. Riding or driving on a cold day, if his feet got cold, sufficed to bring them on; and on this account he had been obliged to give up riding with the harriers, a sport he had been hitherto frequently accustomed to join in. Going out of doors and standing for a few minutes in the cold air, although well clad, had been sufficient to bring on an attack. If he could only keep his hands and feet warm, he told me, he felt safe; but as soon as these parts got cold he was almost sure to have an attack. His countenance was somewhat sallow, and he had been losing strength and flesh.

With this history, I prescribed a tonic and some extract of belladonna, and urged him to wear fur gloves and over-boots when he went out of doors in the cold. Adopting this plan, he passed through the remainder of the winter of 1864-5 almost free from attacks, and improved in health and strength. If such had not taken place, I had determined to advise him to change his residence during the winter to a warmer climate; but this was, if possible, to

be avoided, as it would have involved with him a considerable pecuniary sacrifice.

During the past winter he has got about much more freely, and in the early part of it was almost free from attacks. In the latter part of it, however, he had been less careful of himself, and had suffered accordingly. Sometimes he has averted an attack by going indoors directly he felt it coming on, sitting in front of a fire, and drinking something warm. In April last he wrote to me as follows:—

"My last attack was brought on by riding in the cold, although I did not feel it but very little until I got to the end of my journey, was sitting in a warm room, and had a slight shivering. Had a glass of hot sherry-and-water, and, in about ten minutes, I wanted to make water. Did so, and it was the colour of porter. In about ten minutes again the same irritation as before, and made about a wineglass of water, more blood colour, and the same in about another quarter of an hour. Then I became very warm and feverish, and I did not make water again for more than two hours; when I did so it was quite clear. On Tuesday morning last, when I got up at half-past eight, I washed in cold water, and sat down to breakfast. My feet turned cold, and I felt a little queer, so I turned to the fire, and drank a cup of hot tea, and got warm. When I made water about two hours after, it was the colour of dark ale, not quite so dark as porter. I always use myself to wash in warm water. I still have the cough when attacked, and until the perspiration comes on it does not leave me. After this I feel faint, and sometimes almost faint off. I always feel cold at the chest before passing blood."

The other case is that of a gentleman, rather beyond the middle period of life, who was brought to me by Mr. Acton in December last. The urine passed by the patient at my house was natural in colour, and free from albumen; but I was informed that it was occasionally for one or two micturitions highly charged with blood. Mr. Acton had several times seen it in this state. The history disclosed the same connexion between the attack of hæmaturia and exposure to cold which existed in my other patient, and I expressed the opinion that I considered it to be a perfectly parallel case.

In the "Medico-Chirurgical Transactions" for 1865 cases are recorded by Dr. Harley and Dr. Dickinson of intermittent hæmaturia. Rayer, in his "Maladies des Reins," speaks of intermittent hæmaturia, and refers to reports of two cases that were cured by the administration of quinine. Dr. Harley says, in reference to one of his cases, that the patient replied, when asked what was the matter with him, "I can't tell you; but each time I get cold hands or feet, I pass bloody urine, while my urine at other times is perfectly healthy." This patient was a Londoner, and had never suffered from ague. Dr. Harley's other patient was the subject of malarial poisoning, and had been obliged to return from the West Indies in consequence of repeated attacks of intermittent fever. Dr. Dickinson gives the particulars of a case under Dr. Fuller's care in St. George's Hospital. The patient had twenty years previously been the subject of a tertian ague, but had completely recovered from this, and remained in good health till 1859, when he began to suffer from attacks of hæmaturia, coming on after exposure to cold. He had been frequently an inmate of St. George's Hospital, and was still suffering from the complaint. Within an hour or so after exposure to cold he would have an inclination to pass water, and would void a considerable quantity of black turbid urine, like porter. The urine would retain this character for two or three times of passing, and then resume its natural appearance. Between the attacks the urine was devoid of albumen, and natural. Dr. Dickinson also gives notes of two cases, which had been furnished to him by Dr. George Johnson. In both of these there was no history of ague, and the attacks occurred only after taking a chill. The urine at other times was normal. A fourth case is mentioned, the report of which was furnished to Dr. Dickinson by Dr. Frederick Cock, of Westbourne-park terrace. In this, however, the attacks were of longer duration and less frequent recurrence. After suffering for two or three days from a "severe cold," the urine of the patient would assume a dark colour, like porter, and become highly albumi-

nous. This dark colour afterwards diminished, until, in a fortnight or three weeks, it had disappeared. The albumen diminished simultaneously, and in its turn passed completely away.

The cases narrated by Rayer seem evidently to have been cases of intermittent fever, accompanied with hæmaturia as one of the concomitants arising, it may be considered, from the congestion to which internal organs are submitted during the occurrence of the paroxysm. It is stated by Dr. Parkes that albumen is found in the urine during the fit in a considerable number of cases of ague: in one-tenth according to Finger; in one-fourth according to Martin Solon. Blood (he further says) in some quantity, and renal cylinders, are seen about as frequently as albumen, and occasionally chronic Bright's disease is a consequence of ague.

The cases, however, to which this communication is intended to refer are cases of altogether a different description. There is no evidence that the paroxysms depend upon the existence of any blood poison. There is no regularity in their recurrence. They are brought on by exposure to cold, and exposure to cold only. When the hands or feet get chilled, the patient is seized with shivering, has a general feeling of discomfort, and begins to pass immediately urine more or less dark-coloured from the presence of blood. It may be assumed that there is no organic disease of the kidney, as the urine, except during the attack, is healthy. An alteration in the quantity of the blood, or in the state of the blood-vessels, must constitute the immediate precursor of the escape of blood from the kidney. The rapidity with which the effect upon the urine follows the exposure to cold scarcely leaves ground for supposing that an altered condition of the blood could be set up to occasion it. We have only, therefore, an altered condition of the blood-vessels to fall back upon, and physiology teaches us how rapidly and readily impressions may act through the nervous system, and modify the circulation and nutrition of a part. It is a matter also of the most common observation to witness exposure to cold producing a modification of the circulation in some locality or another. And dispositions of different individuals vary; so that in one the impression of cold, through getting damp feet, for example, should be followed by a coryza; in another, by bronchitis; in another, by pleurisy, or, may be, an inflammation of the lungs; in another, peritonitis; in another, inflammation of the kidney; and so on. There are varying degrees of susceptibility appertaining to different parts to be impressed by exposure to cold in different individuals. In the affection that is being commented upon, it may be considered that an unusual susceptibility of the kidney to temporary congestion from exposure to cold happens to exist. The effect, it may be further considered, is determined by the impression resulting from the exposure acting through the spinal and sympathetic systems on the muscular coat of the blood-vessels. Taking this view, the principle I acted upon in treatment was, first of all, by suitable coverings or clothing, to diminish the risk of the patient getting chilled, and next to fortify the system by tonics, and render it less impressionable by a narcotic.—*Lancet, July* 14, 1866, *p.* 33.

25.—ON DIABETES.

By Dr. G. Owen Rees, F. R. S., Physician to Guy's Hospital, and Lecturer on Medicine at Guy's Hospital School.

[Many must doubt whether the plan of treatment usually adopted by the profession be really the best; whether it is really necessary to deprive the patient of all starchy food which must be required for his system the same as for that of a person in perfect health. Moreover, it is not uncommonly the case that the emaciation which progresses on a diet not containing starch ceases to do so when the patient eats freely of amylaceous food.]

Does the circulation of sugar really do mischief? Let us consider this question. Now, it is beyond doubt that diabetics may take large quantities

of sugar (three-quarters of a pound a day) for weeks without any symptoms occurring. The experiment has been made by many. I myself have performed it, and the patient was very comfortable the while. I have often, too, allowed large quantities of potatoes to be eaten, the diabetic meanwhile looking well and enjoying his diet. The above facts, however, are scarcely so much to the point as those I have observed in patients who have been doing badly while on purely animal diet, and who, when weak and emaciated, have been allowed free use of farinaceous food. The following case is instructive in this respect.

Mr. A——, a farmer, residing in Essex, came to me complaining of extreme weakness, the result of diabetes. He could scarcely walk, and was much emaciated. He had been under strict dieting; no amylaceous food allowed. The urine was of specific gravity 1040, and he passed about four pints and a half in the twenty-four hours. His extreme weakness and general want of power alarmed me, and as his diet had evidently not done him any service, I told him to eat freely of vegetables of all kinds, and to take as much bread as he liked; at the same time I ordered him alteratives and tonics. Now, if the circulation of sugar in the blood tends to develope the evils consequent on diabetes, great injury would have been inflicted on this man by the use of a natural diet. The result showed, however, that he *needed* vegetable diet, for he began to improve from the moment he indulged in it. He gained weight and strength, and soon became nearly as stout as ever.

His history may be briefly told. He lived thirteen years after I first saw him, during the latter portion of which time he became rather stouter than before he was attacked by the disease. Thirst occasionally annoyed him, but not often. He passed from four to five pints of saccharine urine in the twenty-four hours, the specific gravity of which varied from 1038 to 1042. He was able to farm without much trouble, but considered latterly that he was getting weaker. He died, aged fifty-five, from the effects of an injury to the foot. Sloughing took place, and he sank rapidly. It is my decided opinion, from what I saw of him on his first visit, that he must have inevitably died in a few weeks, if not sooner, had he not been allowed an ordinary diet. He himself felt quite certain that the restricted diet was destroying him.

Now, it is not my wish to induce a belief that diabetics cannot live on a restricted diet for a great length of time. Many of them do so—for months, for years. But what I venture to insist on is, that they do better on a natural diet; that saccharine and farinaceous food is as necessary to the comfort and wellbeing of the diabetic as it is to the healthy stomach; that abstinence from starchy and saccharine matter is injurious to the diabetic; and that the circulation of sugar in the blood is not productive of bad symptoms, either immediately or remotely.

It may be argued that diabetic persons have lived for years on a restricted diet, have been moderately comfortable, and have not suffered from the more severe symptoms of the disease. This is quite true; but must we conclude that they have enjoyed this immunity in consequence of a restricted diet? I think what I have just detailed will be sufficient to render it probable that had such persons been allowed ordinary diet they would have gone on far better, and, moreover, not have suffered the inconvenience so constantly felt by those who are subjected to a diet containing scarcely a trace of amylaceous or saccharine matter. I have now had long experience in the management of diabetes, and, from what I have observed, I have resolved never again to countenance the use of the strict diet which has been so vaunted as necessary to the wellbeing of diabetics. In some cases it is very decidedly injurious, as shown by the instance quoted above.

I scarcely care to deal with the theories by which this question of dieting diabetics has been defended, for the reason that all theories must propound error when they are opposed to facts absolutely determined by longer experience. At the same time I can well understand the diabetic watching his own case, and becoming pleased that less sugar is passing from him; and can well imagine his feeling satisfied that some impress has been made on the disease because the two prominent symptoms—viz., the large quantity of

urine passed, and the high specific gravity, approach nearer to the healthy standard. Histories of the sad manner in which this fool's paradise is suddenly broken in upon by death are common enough.—*Lancet, July 7, 1866, p. 4.*

26.—ON THE TREATMENT OF DIABETES.

By Dr. F. W. Pavy, F. R. S., Assistant-Physician to Guy's Hospital.

[The following article is elicited by that of Dr. Rees on the treatment of diabetes.]

It is declared by Dr. Rees that dieting is of no use—nay, worse than useless, prejudicial in diabetes. I must confess I had cherished the idea that a great advance had been made during the last quarter of a century in the treatment of diabetes; and this not empirically, but upon grounds of rational observation. I was thus startled at a declaration which, if true, reduces the question of progress to a mere delusion.

The first case referred to in Dr. Rees' remarks can scarcely, I think, be looked upon as supplying a happy illustration in favour of his proposition regarding the two plans of dieting. The patient was a healthy-looking young woman, who had been for some time the subject of diabetes. She had been under treatment for some weeks previous to falling under the care of Dr. Rees, and had been strictly dieted during that time, receiving, it is said, temporary relief. She was now prescribed for, and her diet was not restricted. In the course of a few weeks urgent symptoms suddenly set in, and she died.

Now, I do not mean to say that such a termination would have been averted in this patient's case had the restricted dietetic treatment been continued, but I do most firmly believe that the chances of its occurrence would have been materially lessened. My experience has led me to the conclusion (and I have been for some time past in the habit of warning my patients accordingly) that the diabetic who allows the disease—I am speaking of the severe form of it—to run on uncontrolled by dietetic management is not safe from one day's end to another. His tenure of life is precarious in the extreme. At any moment urgent symptoms may set in, and in a very short space of time destroy life. From the extent to which the circulating fluid is charged with sugar, a deviation from its normal condition exists, and deprives it, I believe, of its aptitude for properly administering to the functions of life. That the functions of life are not properly performed under an uncontrolled state of the severe form of the disease is sufficiently manifest on looking to the pitiable condition the patient presents. He loses flesh and becomes reduced to a mere skeleton; he has an indescribable sense of general discomfort in his body; his weakness is extreme; he is frequently the subject of cramps; his virility disappears; he is parched with an insatiable thirst; often possesses an appetite that is difficult to appease; and is troubled and disturbed with the inconvenience of having to rise several times in the night to rid himself of a secretion the production of which is profuse in the extreme. Subdue the disease, which can be often completely, and always partially, done by dietetic management, and a miraculous alteration in a short space of time is the result. His urine falls in quantity; his excessive thirst subsides; his face begins to fill out and to lose its previously pinched-up expression; he acquires strength, increases in weight, and regains his virility. In many cases, friends and patient wonder at the restoration that has taken place in even a week or two's time. It is upon actual experience that what I have stated is founded. In some instances the sugar disappears after a little while altogether from the urine, or, if it does not disappear altogether, may become reduced in quantity to a few grains to the fluid ounce. In the case of such a patient the control of the disease is, I believe, in his own hands, and it is his own fault if he allow it to prove fatal. In this condition he is no longer hinging between life and death, as he was before. He is in the position of a healthy person, save with one exception—the power of assimilating sugar;

but as long as this function is not forced into requisition he lives in a state of security. In the process of dieting that is required, certainly in cases where any extreme quantity of sugar is eliminated, half measures prove of no avail whatever. I am frequently told by patients that they have been upon the restricted plan; yet they may have been allowed dry toast or brown bread, or perhaps advised to drink large quantities of milk. Symptoms have thus been kept up which have yielded to a more rigid exclusion of starch and sugar from their diet.

In other instances—and these are especially where the disease occurs in younger subjects—the sugar cannot be reduced below from fourteen or fifteen to twenty grains to the ounce, it having been, under non-restriction, from forty to forty-eight grains to the ounce. Here, although the severity of the patient's symptoms are materially controlled, and, I believe, his life considerably prolonged, yet it too often happens that he slowly declines, and ultimately dies apparently from sheer exhaustion of power, or from lung disease having been set up. It seems as if there is something existing besides what I am convinced is the only fault in many cases—namely, a defective assimilating power over the saccharine element—which strikes deeply at the root of the nutritive changes going on in the body.

It is not to be imagined that the system of dieting is always required to be permanently persisted in. A rigid observance being practised for a time, it often happens that the healthy state becomes thereby so restored, that the patient is ultimately able to take an ordinary diet without any appearance of sugar, or only a little, in the urine. Many cases of this kind have fallen under my observation. The patient at first is suffering from all the symptoms of a severe form of diabetes. He is placed under treatment, and within a few days such an improvement has occurred in his bodily feelings that he has sufficient inducement to steadily persevere in following the recommendations that have been given him. The sugar may have disappeared altogether from the urine. At first, any deviation from the prescribed dietary leads to a reappearance of sugar; but after a while, it may be in a few months or a year, it is found that an ordinary diet may be taken without reestablishing the symptoms of the disease. With persons advanced in life, I look forward to this result as the ordinary occurrence. A lady, upwards of sixty-five years of age, who came to me a fortnight ago from the country, passing urine charged with forty-eight grains of sugar to the ounce, in less than a week passed urine entirely free from sugar. At present the restricted plan is being rigidly carried out, but I look forward to this patient being by-and-by able to return, if not entirely, nearly entirely, to an ordinary mode of living. One thing I could tell her—and this is a matter which affords great relief to patients,—that she had the disease in her own hands, and that it need not curtail her life; which is what, it is my firm conviction, could not have been said if the complaint had been allowed to run on in an unsubdued form.

Here let me state that I hold a quantitative examination of the urine to be indispensable for giving the information about a case that is required. The liquor potassæ test will only give approximate quantitative results, and the copper test, used qualitatively, will react just as strongly with two or three grains of sugar to the fluid ounce as with twenty, thirty, or forty. A quantitative determination being made, it is found, we will say, that only a few grains to the ounce are passed. It is known at once that this is not likely to prove hurtful.

I do not discard or underrate the use of medical treatment in conjunction with the dietetic in diabetes, but without the latter I openly avow that I believe that nothing is to be done by means of the former.

I will not trespass further on your space, but conclude these remarks by referring to a case which I look upon as exceedingly instructive upon the point I have been alluding to. A patient two years ago was the subject of a severe form of diabetes, and, from the loss of flesh that was taking place and other symptoms, made up his mind that he could not live long. In course of a short time, this patient's urine, under the dietetic and medicinal treatment adopted, became free from sugar, and later he was able to take an ordinary

diet without its rendering his urine saccharine. One day he was tempted to take some cider, and drank off a pint at a draught. Almost instantly he began to experience his old sensations, and felt sure the disease had returned upon him. On examining some urine he brought me shortly afterwards, this was found to be perfectly true, and it took some weeks, even under complete restriction, before the sugar disappeared from it again. He, however, is now perfectly well again, and living in an ordinary though careful way, without passing any sugar.—*Lancet, July* 28, 1866, *p.* 106.

27.—ON BRAN BISCUITS IN DIABETES.

By Dr. Arthur Hill Hassall, Senior Physician to the Royal Free Hospital; and Dr. F. W. Pavy, Physician to Guy's Hospital.

[During the past year or two Dr. Hassall has been engaged in making an extensive series of analyses of various articles of food, with a view to determine their fitness or otherwise for the use of the diabetic. One result obtained is very important, viz., the unfitness of the prepared bran and biscuits now sold for diabetic cases, notwithstanding the statements advanced as to the purity of the bran and its freedom from starch.]

The method of purification now in use consists simply in washing and pressing the bran, whereby, doubtless, a small quantity of starch is removed; but since the starch granules are chiefly enclosed in the cellular tissue of the bran, it is obvious that this process must be insufficient for the removal of the greater part of the starch. That it really is so may be proved in a moment by the simple application of a drop of tincture of iodine either to a small portion of the prepared bran or of one of the biscuits made therewith, when they will instantly become of a deep bluish-black colour. But the quantity actually present may be readily estimated by converting it, through the action of a little dilute sulphuric acid, into glucose or grape-sugar, which may be easily washed away, the sugar estimated, and the quantity of starch present ascertained therefrom. Some analyses made in this manner furnished the following results:—

Unprepared Bran.

	Per Cent.
Water	12·04
Oil	2·00
Nitrogenous matter	13·70
Starch	45·65
Gum and digestible fibre	2·95
Fibre	17·66
Ash	6.00
	100 00

Prepared Bran.

	Per Cent.
Water	10·18
Oil	4·65
Albumen	15.20
Starch	44·50
Digestible fibre	77
Fibre	19 00
Ash	5·70
	100·00

Bran Biscuits.

	Per Cent.
Water	9·80
Oil and butter	28·30
Albumen	13·96
Starch	28·20
Gum and digestible fibre	5·02
Fibre	9·60
Ash	5·12
	100·00

The above figures demonstrate the accuracy of the statement already made, to the effect that the prepared bran and biscuits now sold *are totally unfit for the use of patients labouring under diabetes.* They serve also to explain the disappointment which is so generally experienced in the use of these biscuits, the urine still continuing to retain a high specific gravity and to abound in sugar. So general has the use of bran biscuits become, that the fact cannot be too generally known that they contain a very large proportion of starch and of matter convertible into sugar.

Now the method employed in the analysis of the samples of prepared bran and biscuits tested, with certain modifications, furnishes us with a means of freeing the bran absolutely from all starch, and of rendering it an admirable material for the preparation of really pure bran biscuits. I have had the process repeatedly carried out on a large scale, and I find that it answers completely. I further find that there is no difficulty in making from the purified bran a "flour of bran" equal in fineness to wheat flour or my "flour of meat," and thus overcoming another objection to the use of the bran—namely, its coarseness.

Lastly, I would observe that the value of this "flour of bran" is greatly increased by its admixture with a portion of my "flour of beef;" and that thus a mixture is obtained more nutritive, and certainly better fitted in every respect for the treatment of diabetes, than anything hitherto devised.

[Dr. PAVY offers as a suggestion whether torrefaction, by which starch is converted into dextrine—an easily soluble substance—would not prove a manageable process for converting starch into sugar, in order to estimate its amount in articles of diet intended for diabetic patients. He says:]

It is an important matter to the diabetic to be supplied with a variety in the food that is to take the place of ordinary bread, so that he may select that which is most agreeable to him, or, as he gets tired of one, may pass to another. Although the almond food, from its composition, is the best adapted for the complaint, yet there are some persons who cannot consume it on account of a dislike to the flavour of the almond, and then the bran or gluten food must be had recourse to. Of these, my experience, from their effects upon the urine, is that the bran is the better for the diabetes of the two. But a great deal depends upon where the bran biscuits are procured, for there are some sold that are really scarcely less objectionable than the common brown bread; and this, although I frequently find it has been recommended to the patient, is scarcely any improvement upon the white bread in ordinary use amongst us. In proof of what I have asserted I will mention a case that but a short time since offered itself to my notice. A gentleman came to me from the country suffering from a severe form of diabetes. He was passing twelve pints of urine in twenty-four hours, containing forty grains of sugar to the ounce. In less than a month, under the dietetic measures and medical treatment adopted, the urine was reduced to nearly a normal quantity, and contained under eleven grains of sugar to the ounce. The patient had been consuming, as a substitute for bread, bran biscuits procured from Mr. Blatchley, of Oxford-street. A fortnight later I found that the urine had gone up to six or seven pints, and contained upwards of twenty-one grains of sugar to the ounce. The medical treatment was the same, and I was informed by the patient that he had adhered strictly to the dietary he had been ordered. I felt sure there must be a cause for this change in what was taken, and I

closely questioned my patient upon what had been eaten and drunk at each meal for a day or two past, but failed to discover that he had committed any error. A few minutes afterwards he produced from his pocket a specimen of bran biscuit which had been made for him by a confectioner in his neighbourhood, and asked me what I thought of it. Here, I at once discovered, was the source of mischief I had been looking for. The biscuits were palpably enough, probably for the sake of improving their taste and appearance, contaminated with a quantity of flour; but to my patient they were bran, and, as far as he knew, proper bran biscuits. He at once discontinued them and returned to those he had been previously taking, and immediately, as I had predicted, his diabetic condition abated.

The "flour of meat," introduced by Dr. Hassall, I think supplies what has hitherto been wanted for general purposes in practice, and forms a convenient article of food for the diabetic.

[In another letter in the Lancet Dr. Hassall says:]

Dr. Pavy, in the communication inserted in the Lancet of the 23rd inst., threw out the suggestion that torrefaction of the bran, whereby the insoluble starch becomes converted into soluble dextrine, might afford a simpler and more manageable means of freeing the bran from starch than my method by dilute sulphuric acid.

This suggestion I have put to a practial test, and found that 100 grains or parts of the bran, carefully torrefied at a temperature of 320° Fahr., lost, after being well washed, 24 grains or parts of its weight; that the residue on treatment with iodine became almost black: thus furnishing evidence of the presence of starch in large quantity, and, on analysis, an amount of glucose corresponding to 22 grains of starch was obtained. These particulars afford conclusive evidence against the process by torrefaction, whereby, although a portion of the starch may be removed, a considerable quantity is still retained by the bran. There is, however, a process which I have had in my mind for some time past, and which recently I have tested practically. It is based upon the conversion of the starch into dextrine through the action of *Diastase*. This method of purifaction is so easy and perfect that it leaves nothing further to be desired; and the results, so far as the colour and composition of the bran are concerned, are certainly superior to those obtained by means of sulphuric acid. Nevertheless, I am of opinion that, in extreme cases of diabetes, the acid method is to be preferred.

It is necessary, in the interest of those who have the misfortune to labour under diabetes, that it should be clearly understood that the analyses given by me of the so-called Pure Bran and Bran Biscuits were by no means exceptional. They were made from samples prepared by one of the most careful makers; and I have never yet met with a bran biscuit which did not abound in starch, while even those sold at the present time, no matter where obtained, still contain starch in very large amount, turning absolutely black with iodine. I wish it also to be clearly understood that I do not lay the least blame of this state of things upon the makers; they, I believe, do their best. The radical fault is not with them, but in the process which they adopt, and which they have been taught to believe was effectual.

I conclude this note with an analysis of *Gluten Bread*, which shows how much the amount of starch present in it has been underrated, and how unfitted it also is for the use of the diabetic, except in the mildest cases:

	Percentage composition.
Water	9·30
Oil	1·26
Gluten	60·81
Starch	16·33
Dextrine and undetermined matters	9·70
Ash	2·30
Fibre	·30
	100·00

—*Lancet, June* 9, 23, *and* 30, 1866, *pp.* 640, 698, 719,

SURGERY.

AMPUTATIONS, FRACTURES, DISLOCATIONS, ETC.

28.—ON AMPUTATION ABOUT THE FOOT AND ANKLE.

By Henry Hancock, Esq., Surgeon to Charing Cross Hospital, and Professor of Surgery in the Royal College of Surgeons.

[With two slight exceptions, previous to the year 1828, when Mr. James, of Exeter, introduced Chopart's operation into England, affections of the foot, whether from disease or accident, were abandoned indiscriminately to amputation of the upper third of the leg. Syme's operation, introduced in 1845, brilliant and scientific as it was, influenced the actual surgery of the foot but little.]

At this time British surgery boasted of but four standard operations connected with the foot—viz., excision of the astragalus, and Hey's, Chopart's, and Syme's amputations. And so matters continued until the year 1847, when Mr. Thos. Wakley performed his celebrated operation for resection of the lower ends of the tibia and fibula, with excision of the astragalus and os calcis. This was followed soon after by the equally celebrated operation of Mr. Teale, of Leeds, wherein he excised the os calcis, astragalus, and cuboid bones, and thus instituted a new era in the British surgery of the foot. To my mind, these two operations rank among the highest and most brilliant achievements of modern surgery.

Previous to this, as we have seen, operative surgery of the foot consisted in amputating between the disease or accident and the body. To remove a diseased bone from amongst healthy bones; to remove a bone from the posterior part of the foot without at the same time sacrificing the anterior portion of that organ, had been deemed (Liston's case excepted) an impossibility. But these operations showed that not only could these impossibilities be overcome, but that even disease, unpreceded by injury and situated in the posterior region of the foot, might be removed—nay, might even be removed with advantage to the patient; and that disease of this region, contrary to what had been previously imagined, did not of necessity involve the destruction of the entire foot. The result was what might have been expected; surgeons began to shake off the trammels of custom, and to think for themselves. They began to consider the beautiful mechanism of the foot, or any portion thereof, however small, as something worth preserving; and, accordingly, we now enumerate as standard operations, in addition to those already enumerated, "excision of the ankle-joint," "excision of the os calcis," "excision of the cuboid bone," "subastragaloid and Pirogoff's amputations," besides other operations performed in almost every region of the foot. On the 1st of May, 1855, Mr. Teale surpassed his previous operation in removing from the foot of a young woman, aged twenty-two, the calcaneum, astragalus, navicular, and cuboid bones. The patient returned in six months to her duties as a domestic servant, and is now engaged in making clothes by the sewing-machine. When she has much walking she relieves herself by the use of a stick. Mr. Teale has with the greatest kindness authorised me to present the cast of the case I now exhibit, in his name, to the museum of this College. In allusion to this and other operations he observes: "The general result has been very satisfactory. Indeed, I have adopted them as freely for disease limited to the posterior part of the foot as I have done Chopart's for disease limited to the anterior part. There is, however, one condition necessary to success—namely, that we select such

cases as are the result of pure, healthy (if I may so say) inflammation of ligaments, and not those which have originated in the cancellous structure of the bones, and which Sir B. Brodie rightly attributed, as I think (despite of what is now-a-days talked about as strumous synovitis), to struma."

A French author, in a treatise of comparatively recent date, asserts that no one has ever proposed, as a standard operation, to amputate through the continuity of the anterior row of tarsal bones. These operations, recommended by necessity, should never become the rule. Those surgeons who regard the foot as a solid whole, and who perform these operations, have the advantage of making a regular-shaped wound, but they expose the patient to the double danger of section of the bones and of the joints. Matthias Mayor, he continues, "in one of the eccentricities for which he was notorious, would reduce this study to its most simple form. According to him, the foot is but an undivided whole the same as the leg or thigh. The only questions which govern him are the extent or limits of the disease. He cuts through the soft parts and exposes the bone behind these limits, and applies the saw on their continuity as far as possible from the tibio-tarsal joint, without considering the small bones or the difficult joints which the instrument may divide. We will not," he continues, "pause to refute this doctrine of the surgeon of Lausanne, which, if he will pardon the expression, would rather cut the Gordian knot than try to untie it." I cannot help thinking that the eccentricities of M. Mayor, at all events in this instance, take a very sensible form, and that he is a better surgeon than his criticiser; for, whilst *he* acted from practical experience, the latter has evidently written from theoretical imagination only. Malgaigne, on the contrary (at page 277 of the seventh edition of his Manual), says, if by sawing the bones of the tarsus across, instead of disarticulating them, we can thus preserve a portion of the second row of tarsal bones, the result would certainly warrant our taking the method into serious consideration.

Having given this subject more than average attention for many years past, I entirely endorse M. Mayor's views. I would reduce this study to its most simple form. I would desire to be governed by the tangible reality of the extent or limits of the disease rather than by the doubts and uncertainties of abstract theories, and I consequently advocate strongly as a standard operation "to amputate through the continuity of the first or second row of tarsal bones in preference to sacrificing joints when there is no necessity for such sacrifice." I do this, not because I regard the foot as a mere undivided whole like the thigh or leg, but because I regard it as an aggregation of several parts, each perfect in itself, placed there for a given purpose; each and all of far too great value to be destroyed without a cause, and, above all, because the experience of many years has proved to me the safety and value of this proceeding.

Mr. Morgan, whose declining health has deprived the Bristol Hospital of his valuable services, appears, with the exception of Mr. Gay and Mr. Tudor (of Dorchester), to be the only British surgeon who, as far as I can discover, has systematically followed this plan. He writes me—"I may perhaps be permitted to state the result of my experience on two points of practical interest. 1st. In amputation of the anterior part of the foot, more forward than Chopart's operation, the patients do very well by ignoring the joints and sawing through the bones at the point of election." Mr. Gay also says—"I always saw through the row of tarsal bones, keeping as close to the front articular processes as possible; for in a case which I had in the Free Hospital in 1845, the wound was kept open by the extrusion of the cartilages." Whilst Mr. Tudor observes—"I never found the slightest disadvantage in sawing straight through the bones, whatever part of the foot it may be in, without following the principles laid down in some books, of passing the knife between the articulations."

I advocate this practice also because I regard the joints themselves as of especial value as completing the mechanism of the parts connected with them. The medio-tarsal joint, for instance, completes the posterior segment of the longitudinal arch. Destroy this joint, and the calcis and astragalus

at once become deprived of their anterior support, with the consequent elasticity and motion. Can anything be more unphilosophical than to advocate the sacrifice of any bone or joint of the foot for no other reason than that a particular operation should be performed? But yet this has been done, and in the following terms:—"The scaphoid bone is sometimes left in Chopart's operation in front of the astragalus through inadvertence. We once saw Dupuytren commit this error. Lisfranc even relates a case in which he saw the scaphoid left, and which ended successfully." It is scarcely possible to conceive greater ignorance of the subject or of the value of the parts than these observations evince.

The result of my experience convinces me likewise that the danger of pyæmia from cutting through the tarsal bones has been greatly exaggerated; indeed, it would seem, after all, to be of very rare occurrence in this country, for judging from the returns with which I have been favoured from all parts of England of the several operations performed upon the foot, the occurrence of this malady does not amount to one per cent. upon the number of operations performed. And indeed when we compare the extent of cut surface exposed in the soft parts with that of the bones, it is difficult to understand why, when it does occur, it should be attributed so entirely to the bone and not to the soft parts; and I have moreover seen it so frequently follow operations where no bony structure was either exposed or involved, that I must confess my scepticism in the matter. And to me it is an interesting fact, as supporting this opinion, that Mr. Syme, in enumerating the advantages of his operation, observes, "The tibia and fibula are divided through the *cancellated* structure, and you thus avoid the danger connected with opening the medullary hollow, especially where there is a disposition to phlebitis."

[Disease in the bones of the foot is frequently so superficial that the removal of a very thin slice is sufficient to eradicate the mischief. Disease commencing in an articular surface may exist there for a considerable period without invading the cancellated structure of the lower end of the tibia. Mere increased vascularity and softening without actual change of structure or deposit of tuberculous matter is not sufficient to justify the condemnation of the entire bone.]

I would venture to offer the following suggestions as to operations on the foot:—

That we should perform our operation as close to the diseased or damaged structure, and preserve as much of the foot, as we possibly can do with safety to our patient.

That where practicable, we should cut through the tarsal bones with a saw in preference to disarticulating them.

That we should avoid the destruction of joints whenever we can do so.

That disease of one articulating surface does not of necessity demand the removal of the entire bone; as, for instance, when confined to the tarso-metatarsal joints, or to the joints between the cuneiform and scaphoid, it is not always necessary to remove the whole of the cuneiform bones on the one hand, or of the entire scaphoid bone on the other. In such cases, however, the diseased portion should be removed by a clean cut made with a saw, and not bruised off by a gouge or chisel.

That whilst the openings in the skin cannot be relied upon as indicating the exact situation of the bone mischief, the existence of these openings, even if there be several, or the thickening and discoloration of the skin and soft parts, do not of themselves contraindicate operative procedure, since, as pointed out by Sir W. Fergusson, the soft parts, when relieved of the source of irritation, will speedily return to their natural condition.

After partial amputation of the foot, the bones, ligaments, and muscles, especially in young patients, appear to accommodate themselves to the altered condition of parts. The bones will, in some instances, become changed even in size and form, whilst the muscles contract new adhesions. These, however, are not the only phenomena which occur, tending to the reparation of parts. I allude to the deposition of new bone, either from the extremities of long bones, or from periosteum, or from the cut short bones.

Textor expressly asserts the new formation of bone, and this to a precise extent necessary to produce a new and perfect articulation of the ends of bones upon each other. He states that he found lengthening of the ulna to the extent of a quarter of an inch on which the radius moved, as in the natural condition, and the trochlea of the humerus appeared as perfect as if none of it had been taken away. Wagner, on the other hand, asserts that examination during life of persons who have recovered after extirpation of short bones, shows that the defect has been remedied, as far as possible, by the approximation of the bones which lie nearest together, the interval which is left appearing to be filled up with a ligamentous material, in which, according to Reid, masses of cartilage or bone are sometimes deposited.

Sir W. Fergusson, in a case which he amputated at the tibio-tarsal joint seven years after he had extirpated the inner half of the os calcis for caries, found the bone partly regenerated, and the place of the lost substance partly occupied by a fibro-cartilaginous material.

I would also remind you of the following highly practical observations made by Mr. Hilton whilst your Professor of Surgery:—"Surgeons should be careful not to disturb unnecessarily the granulations or periosteal membranes which they meet with in operations associated with diseased bone, but, on the other hand, leave all the vascular granulations which surround the diseased bone and line the inner aspect of the periosteum; for experiments, experience, and sound physiology show that if we can secure these bone-producing vascular structures from local injury, we give Nature a fair chance of manifesting her powers of speedy reproduction or removal of bone. No doubt in this case [one which he had described] a representative cuboid bone has been reproduced, for there is an equal and continuous ossific resistance along the whole length of the outer side of the tarsal portion of the patient's foot."

We have, however, still much to learn with respect to the deposit of new bone, which we frequently observe takes place without either of the above-mentioned causes. The mere alteration in the relation of parts would seem to be sufficient for its production. Witness the result of an unreduced dislocation of the head of the humerus or of the femur; the displacement of a tendon from its natural groove (as seen in the preparation before you). The tendons of the peronei muscles were displaced from their groove behind the fibula; there was no fracture, no exposure of cancellated structure at that situation, but nevertheless we find a new osseous hook, or hemular process, thrown out for the purpose of compensating these tendons for their lost position. And again, observe what obtains when muscles are violently or accidentally separated from their attachments. I have seen three cases of violent detachment or rupture of the adductor longus muscle from the pubes. They all occurred in the hunting-field, the patients having been forced to throw the adductor muscles into sudden and violent action from their horses shying, jumping, or lunging unexpectedly. In neither case did I see the patients for some weeks after the occurrence. They all informed me that they felt something snap at the time; that they experienced great pain, and could no longer grasp the saddle; that they had gradually lost the pain, but were now frightened by finding something form in the upper and inner part of the thigh. Upon examination I found the adductor longus muscle in all the three cases separated from its attachment to the pubes, in one instance to the extent of nearly two inches, whilst the interval between the two was filled by a bony styloid process, or exostosis, originating from the body of the pubes, and giving attachment by its other extremity to the detached muscle.

[Various modifications of Syme's operation have been proposed.]

Blandin and Handyside advocate lateral flaps, alleging that they prevent bruising and twisting of the soft parts in removing the os calcis; but, as Mr. South justly observes, there is no necessity to bruise or twist the soft parts, whilst the side flaps do away with one of the principal advantages of Syme's operation, the preservation of the dense structures especially designed for supporting the weight of the body.

Messrs. Spence and Goodsir commence by the usual dorsal incision, and then carry the knife deeply across the plantar surface of the heel, from the internal to the external malleolus, where the incisions commenced. Having thus formed the flaps, they cut through the external lateral ligament, and, keeping the knife close to the bone, divide the internal lateral ligament and soft parts on the inner side of the foot, which is next turned forwards. The tendo Achillis is then cut through, and the bone easily turned out from the plantar flap. The benefits they assign are greater facility and rapidity, and less twisting and manipulation of the plantar flap.

The late Dr. R. J. Mackenzie, of the Edinburgh Infirmary, advised: "The point of the knife to be entered at the mesial line of posterior aspect of ankle on the level of articulation, and carried obliquely downwards across the tendo Achillis towards the outer border of the plantar surface of the heel, along which it is continued in a semilunar direction. The incision then curved across the sole of the foot, terminates on the inner side of the tendon of the tibialis anticus, an inch in front of the inner malleolus. A second incision is carried across the outer side of the ankle in a semilunar direction between the extremities of the first incision, the convexity directed downwards, and half an inch below the external malleolus. The flap is next dissected up, the knife being kept close to the bone to preserve the whole thickness of the soft parts; and by holding the base of the flap between the finger and thumb as it is detached from the bones, all risk of wounding the artery is avoided. The foot is then severed at the articulation, and a thin slice, with the malleoli, removed by a saw, as in Syme's operation."

M. Sédillot advocates a similar proceeding, which is said to be superior to that of Syme in cases wherein the integuments on the outside of the foot are unsound; in old people, whose arteries are not well suited to bear with impunity the stretching which occasionally occurs in separating the integuments from the heel process; and lastly, from its being more easily performed.

Mr. Quain, on the other hand, maintains the plantar flap, but after making the cut across the sole of the foot from one malleolus to another, he carries a second at right angles with it on the outside of the foot back to the heel between the point of the outer malleolus and the margin of the foot. He cuts the inferior flap short, and bevels off the edges of both flaps, so that skin should meet skin. He first performed this operation in the year 1851; and claims as its advantages greater facility of performance, and diminished probability of collections of matter and occurrence of gangrene.

But of all the modifications, that which has attracted the greatest attention and taken the firmest hold upon the profession is the one introduced by Pirogoff during the Crimean war, and which is now universally recognised as Pirogoff's operation. This consists in sawing through the os calcis from above downwards in front of the heel process, and leaving the latter undisturbed in the soft parts constituting the posterior flap, instead of dissecting out the entire os calcis as in Syme's method.

Pirogoff's method, as given by Mr. Spencer Wells, is as follows:—"He commences his incision close to the front of the external malleolus, carries it vertically downwards to the sole of the foot, then transversely across the sole, and lastly obliquely upwards to the inner malleolus, where he terminates it a couple of lines anterior to that process; the inner extremity being carried some lines more forward than the outer, to avoid wounding the posterior tibial artery prior to its division. Thus all the soft parts are divided at once to the os calcis. He then connects the outer and inner extremity of the first by a second semilunar incision, the convexity of which looks forward, and cutting through the soft parts down to the bones, he proceeds to open the joint from the front, cuts through the lateral ligaments, and thus exarticulates the astragalus. He then places a small amputation-saw upon the os calcis behind the astragalus, exactly upon the sustentaculum tali, and cuts through the os calcis, so that the saw passes into the first incision through the soft parts. Lastly, he separates the short anterior flap from the two malleoli, and saws through both of them close to their bases. He then turns the posterior flap forwards, and bringing the cut surface of the os calcis in

apposition with the articular surface of the tibia, he unites the two flaps by sutures, always leaving the angles of the wound open to admit of free discharge. Should the articular surface of the tibia be diseased, it is sometimes necessary to saw off a thin slice from it with the malleoli."

It would appear from this description that when the articular surface of the tibia is healthy, Pirogoff brings the cut surface of the os calcis in contact with the cartilage investing that articular surface. At all events it is doubtful whether he does or does not. I regret that I cannot clear this point up. I wrote to M. Pirogoff expressly upon this subject, but as yet I have not received a reply.

Be this as it may, he claims the following advantages for his operation :—

1st. The tendo Achillis is not divided, and so we avoid all the disadvantages connected with its injury.

2nd. It also follows that the base of the posterior flap is not thinner than its apex, whilst the skin on the base of the flap remains united with the fibrous sheath of the tendo Achillis.

3rd. The posterior flap is not cup-like as in Syme's method; and its form, therefore, is less favourable to the collection of pus.

4th. The leg after the operation appears an inch and a half (sometimes more) longer than in the three other operations (Syme's, Baudens's, and Roux's); because the remnant of the os calcis left on the flap, as it unites with the inferior extremities of the tibia and fibula, lengthens them by an inch and a half.

5th. It serves the patient as a point of support.

Up to April, 1853, he had performed the operation three times, upon patients aged respectively twelve, thirteen, and nineteen years. All recovered well, and two walked without crutch or stick, and without limping. He adds a remark well worthy of notice, and one also which confirms what I have already advanced in my second lecture: "That notwithstanding the suppuration and the considerable gravitation of pus in the third case; notwithstanding the softness and fatty degeneration of the os calcis, which could be cut with a knife, still the remnant of the os calcis united firmly with the tibia. In the second case (he adds) he found pus in the joint during the operation, the cartilages inflamed and decayed, the ends of the bones softened, and a fatty degeneration; yet the result was most successful." As regards this point, Mr. Croft, in his excellent paper "On the Experience of the Surgeons of the *Dreadnought*," in this operation, remarks: "I may observe that, although the os calcis may be diseased at and about the articulating surfaces in instances of scrofulous disease of joints of tarsus, it is rarely that the posterior part is rendered too unhealthy to be made use of in the formation of the stump."

Mr. Busk recommends that the os calcis should be cut obliquely from behind forwards, instead of vertically. And for this purpose he inserts the saw well behind the calcaneo-astragaloid articulation. He says that the advantages of his section of the bone are: that a more extensive surface of the bone is brought into contact with the tibia; that the remaining portion of the os calcis does not require to be rotated so much on its axis as would be required in Pirogoff's operation; that the tendo Achillis is not so much stretched; and that the portion of the heel naturally in contact with the ground still remains the basis of support.

Watson, of Glasgow, recommends the incision to be made across the sole of the foot, from one malleolus to the other down to the os calcis. He then cuts through the os calcis obliquely to avoid the malleoli. Then resuming his knife, he places it between the cut surfaces of bone, and cuts the posterior flap upwards and backwards until he gets fairly behind the ankle. An assistant then turning this flap upwards, and at the same time gently drawing up the skin of the front of the ankle, Dr. Watson carries his knife round the front of the joint, dividing the tendons, and then with a saw completes the operation by cutting through the tibia and fibula downwards and backwards.

The originality of this proceeding has been denied by Dr. Martin, of Warrington, who writes that he saw Dr. Pirrie perform the same operation

more than two years before; and, indeed, at p. 754 of Pirrie's work "On the Practice of Surgery," we find, *quoad* Syme's operation: "Instead of disarticulating the foot, and then sawing off the malleolar processes and thin piece of tibia, I have, after making clearance for the saw by sending the knife round the bones, sawn off the malleoli, &c., without effecting disarticulation. This shortens the proceeding; and, whenever I have performed this operation, nothing could have been more satisfactory than the results."

Staff-Surgeon Williamson, Fort Pitt, recommends that the lower ends of the tibia and fibula should be sawn off obliquely from before upwards and backwards. This facilitates the adaptation of the os calcis to the end of the bones greatly, and is certainly well worthy of consideration. He relates a case operated upon by him on Dec. 24th, 1858, wherein the os calcis fitted admirably; the wound healed readily, and a very solid stump resulted.

Mr. Curling adopted this method on Jan. 5th, 1859; but the result of his case is not given.

Sir William Fergusson also cuts through the os calcis from below upwards. He begins his incision at the internal malleolus, carrying it across the sole of the foot to the external malleolus. He then saws the os calcis through from below upwards, after which he makes the incision on the dorsum of the foot, and separates it from the leg. In one case he found the astragalus firmly anchylosed to the tibia. He therefore cut through tibia and fibula, and removed them altogether.

In treating of the advantages and disadvantages of Syme's operation, I considered that operation, as you may remember, upon its own merits, or at all events with reference to amputations of the leg only. I drew no comparison between it and Pirogoff's modification. I was anxious to avoid repetition; and, moreover, such comparison could only be made satisfactorily when we had the objects and *modus operandi* of both methods before us. As we are now in possession of these facts, I will proceed to consider the advantages and disadvantages of Pirogoff's operation as compared with those of Syme's, not only with reference to civil but also as regards military surgery.

Mr. Busk, who maintains Syme's originality in demonstrating that a useful flap could be made from the natural cushion of the heel, and who entertains the highest possible sense of the great merits of the operation, writes that since the introduction of Pirogoff's proceeding he has never had occasion to adopt it.

According to Mr. Busk, the advantages of Pirogoff's operation are: greater facility and rapidity of performance; less disturbance of parts to form the cushion; a solid instead of a hollow flap; and a greater length of stump by an inch and a half.

According to Mr. Erichsen, they consist in the stump being longer, and better adapted for pressure; in the readiness of the union between the two applied osseous surfaces; and in the less likelihood of the supply of blood to the posterior flap being interrupted, as its vascular communications are not much disturbed, and the plantar arteries can always be cut long.

I do not see the force of the latter proposition, as there is nothing in Syme's method to prevent the plantar arteries being cut as long as the posterior flap, which is all that can be done in Pirogoff's operation.

Mr. Paget informs me that he has performed Pirogoff's amputation several times with a completely satisfactory result, and that he thinks more highly of it than of any other operation of the kind.

Mr. Partridge considers that there cannot be a doubt of the superiority of Pirogoff's method over that of Syme.

Mr. Henry Smith, though, as we have seen, so successful in his performance of Syme's operation, says it is his intention to adopt Pirogoff's for the future, as of its superiority no one who has seen a few cases can doubt.

Mr. Wood's experience of Syme's and Pirogoff's operations has been favourable to both, but he thinks the stump of the latter operation has been generally better.

Mr. Cadge, of Norwich, has the highest opinion of both. He does not think there is much advantage in one over the other, as the resulting stump in both is to his mind the best possible.

The objections urged by Mr. Syme are—

First, that the os calcis is a bone predisposed to caries, and it is therefore undesirable to leave any part of it. Surgeon Cusack and Surgeon Little both performed *à la Pirogoff*. In both cases disease returned in the portion of the os calcis left behind, and necessitated the removal of the limb. The operation is certainly open to this objection, and undoubtedly cases similar to those here quoted sometimes occur.

For instance in a case operated upon by Sir W. Fergusson, he four months afterwards gouged away dead bone, and four months after that there were still dead bone and fistulæ.

In another case operated upon by the same distinguished surgeon, three months after the operation fistulous openings remained, though the patient could bear pressure.

Mr. Simon, in one of his cases, had to remove secondarily two pieces of dead bone, and at the end of 426 days union was still infirm.

In a second case he had to remove a portion of the os calcis. Obstinate sinuses remained, and the patient was not cured for 483 days.

We should not forget, however, what has been stated by Pirogoff—that, notwithstanding the os calcis has been so soft that he could cut it with a knife, still the remnant of the os calcis united firmly with the tibia, and the patient was able to walk freely without the aid of either crutch or stick.

Of fifty-eight operations performed by British surgeons, I find that, including the above two quoted by Syme, five were succeeded by amputation of the leg, of which one was performed a few days after the original operation for secondary hemorrhage.

Mr. Butcher, of Dublin, and Mr. Walsh, of Worcester, each relate a case in which they commenced their proceedings for Pirogoff's operation, but in consequence of the condition of the calcis found it necessary to convert them into Syme's operations. Mr. Lowe, of Lynn, in 1860, commenced Pirogoff's operation on a boy aged twelve, for caries of the tarsal bones. He found the os calcis diseased, and gouged it away, merely leaving the periosteum. Unhealthy ulceration, however, attacked the stump, and he was subsequently obliged to amputate the limb. Whether these gentlemen were unduly alarmed at the condition of the os calcis or not, these examples do not appear to me to detract from the value of Pirogoff's operation in proper cases. They add, however, greatly to that of Syme's, since they show the applicability of the latter where the former cannot be trusted.

Mr. Syme's second objection, that the operation is greatly complicated by the employment of chain saws, &c., is negatived by the fact that chain saws are neither necessary, nor are they at present employed in its performance.

His third objection is, that union between the two osseous surfaces is not likely to take place easily.

Mr. Busk has shown that this objection is groundless. In Mr. Tudor's last case the bones had united on the twelfth day. In Busk's first case the patient stood on the fourteenth day. Mr. Croft says, in two of the *Dreadnought* cases, the calcis was firmly united to the tibia in three weeks; whilst the recovery of Mr. Partridge's two cases is stated to have been very rapid.

Mr. Syme's last and principal objection is, that the integuments of the heel, which should form a cushion for the patient to rest upon, are necessarily carried forward, and the end of the stump is covered by skin, which is not designed for sustaining the weight of the body.

If this objection were valid, it would at once reduce the operation to the level of Baudens' proceeding; but Mr. Busk has proved that when the os calcis is cut as he advises, that portion of the heel naturally in contact with the ground still remains the basis of support.

The great disadvantage attending this operation is undoubtedly the collection of matter in the sheaths of the tendons so frequently observed after its employment. Pirogoff attributes this to the tendons being cut too short, and retracting either within or beyond their sheaths. He adds that he fears nothing so much; and strongly advises that the tendons be fixed before and during the operation, and that the limb be maintained in one position, as

the best means of avoiding this complication. Mr. Busk, on the other hand, reports that suppuration occurred in some if not all of his cases, notwithstanding the methodical application of compresses, as suggested by Pirogoff; whilst as we shall see further on, Messrs. Marsh and Ashdown, of Northampton, purposely cut the tendons as short as possible, and both their cases escaped this complication.

Mr. Tudor, of Dorchester, whom we have seen, as one of the surgeons of the *Dreadnought*, among the first to perform this operation in England, says: "It appears to me that Syme's is in many cases to be preferred, because we know that when one tarsal bone is affected the others very soon become so, and this from constitutional causes; and though at the time of operation the os calcis may not be diseased, still from the extra pressure put upon it, and from the abnormal position in which it is placed, I should fear risk was incurred by exciting that disease in this now *more* important bone, which we may suppose originally existed. The comparative length of the stump I consider to be of little moment, because the difference is so very trifling. Again: I consider the amount of skill required in the performance of Pirogoff's operation to be greater than in Syme's," &c.

Mr. Henry Thompson objects that, in consequence of the increased length of stump, it is more difficult to adjust an artificial foot. Neither can he imagine that the retaining a portion of bone in the lower flap can contribute in any way to a rapid convalescence.

I have collected, as far as I have been able, the particulars of 58 cases of Pirogoff's operation performed by British surgeons. I have not in this table included those reported by Pirogoff; for although this eminent surgeon reckons nearly 100 cases performed in Russia, he does not give any available statistics to enable us to arrive at a satisfactory or definite conclusion. Of the above 58 cases, suppuration in the course of the sheaths of the tendons and in the neighbourhood of the stump is especially noticed in 11; whilst sloughing of the flap occurred only in one case, and in that it is attributed to disease of the blood-vessels. 5 cases out of the 58 terminated fatally, or about $9\frac{2}{5}$ per cent. Of these 1 died of pyæmia, one of exhaustion attending kidney-disease, and 3 after accidents—2 on the same evening, and 1 in four days. 5 suffered secondary amputation. Of these, the original operation in 4 had been performed for caries, and in 1 for accident, the secondary operation being required for hemorrhage. 43 terminated favourably, affording the patients good and useful stumps. Of these 25 were performed for caries, 2 for frost-bite, and 18 for accidents. The result of 3 is not known.

With regard to the period of cure I am enabled to give you a somewhat higher percentage of results than I could of Syme's; for whereas of 219 cases of the latter I could only give the results of 40 (rather less than one-fifth), of 58 cases of Pirogoff's I am enabled to give the result of 15 (a fraction over one-fourth).

Of these 15 cases, 8 had been operated upon for caries, and 7 for accident.

Of the 8 former—

1	recovered with firm stump	in 7 weeks.
1	" " "	8 "
2	" " "	12 "
1	had firm stump, but also fistulous openings	12 "
1	recovered with firm stump	40 "
1	" " "	69 "
1	had infirm stump	61 "

Of the 7 latter—

1	recovered with firm stump	in 6 weeks.
1	" " "	7 "
1	" " "	8 "
1	" " "	10 "
2	" " "	12 "
1	" " "	24 "

So that whilst in the former class of cases the period of recovery varied from 7 weeks to 69, in the latter it varied from 6 to 24 weeks.

Croft reports that in 3 cases the remnant of the os calcis united to the tibia in 3 weeks; in 1, in 12 days.

Mr. Busk reports that one of his patients stood on the 14th day. He saw another 7 months after the operation; he had in the mean time been a voyage and worked as a seamen.

Mr. Sympson, of Lincoln, states that a patient upon whom he performed this operation can now walk fourteen miles a day without fatigue.

Mr. Partridge also reports the recovery of two of his cases as being very rapid.

Mr. H. W. Budd, of Worcester, has, with the greatest kindness, furnished me with the particulars of the two following original cases:—

J. C——, aged twenty-six, admitted into the Worcester Infirmary on Feb. 24th, 1866. Foot smashed by a railway accident. The astragalus, os calcis, with the integuments of the heel, uninjured. A wound extending from about two inches above and behind internal malleolus, across the front of the ankle-joint, to a corresponding point above the malleolus externus. The integumens of the upper margin of the wound were separated upwards for an inch. They were cold, and there was extravasated blood here and there. Although sloughing was apprehended, Pirogoff's operation was decided upon. The case went on favourably. The patient has an excellent stump, half an inch shorter than the sound one.

March 31st. Union of bone perfectly firm. He has been walking about well for some weeks. A very small portion of integument sloughed.

April 29. Discharged cured.

J. L——, aged eighteen, admitted, under Mr. Budd's care, Feb. 26th, 1866, with disease of ankle-joint and tarsus of twelve months' duration. There were two sinuses, one on each malleolus, communicating with dead bone. Great pain on pressing astragalus against tibia. Considerable swelling of foot.

March 26th. Pirogoff's operation performed. All the bones of ankle-joint were diseased. The os calcis was very soft, and the soft parts were infiltrated with gelatinous or scrofulous substance. This infiltration and the os calcis compelled Mr. Budd to remove more of this bone and the tibia.

The case did well, without any bad symptom. The stump, Mr. Budd says, is a famous one, the *best* he ever saw, one inch and a-half shorter than the other leg.

Discharged cured May 20th.

Mr. Ashdown, of Northampton, has also kindly supplied me with the particulars of the two following cases, which certainly go far to establish the value of Pirogoff's amputation.

E. P——, aged twenty-nine, married, a very delicate woman, four months advanced in pregnancy, admitted May 16th, 1858. Three hours previously a gun, charged with common sized shot, fell from its support and went off on the ground a few feet from her, the contents striking the sole of her left foot. There was copious hemorrhage at the time. When admitted, after a journey of twelve miles, she was collapsed; pulse quick and feeble; countenance pale and anxious. When the bandages were removed there was considerable oozing of venous blood. The integuments and muscles of the soles of the foot, the heel excepted, were ploughed up from the bones; the metatarsal bones all more or less fractured and comminuted; the integuments generally livid and pulpy, and the great toe hanging loose from the rest of the foot.

The patient having rallied sufficiently in a few hours, Mr. Marsh removed the foot by Piragoff's amputation. In so doing the posterior artery was divided above its bifurcation and ligatured, and Mr. Marsh having made the tendons protrude as much as he could, cut them short off, and brought the parts together. For the first two days the patient was very feeble, feverish, and sick, the vomiting (of pregnancy apparently), which had been troublesome for above a month, being now constant. She ultimately, however, did well, and six weeks after the operation was out of doors, and in another

week left the hospital. She was in due course confined, and was ill for a long time after, but for many months past has walked upon the stump regularly, and without inconvenience.

E. B ——, aged forty-two, admitted under the care of Mr. Ashdown, Feb. 24th, 1860, having had her feet entangled in the machinery of a thrashing machine a few hours previously. Mr. Ashdown performed Pirogoff's amputation on the right foot. The wound healed by first intention, and the patient did well until the tenth day, when bilious vomiting came on, and lasted a week. She, however, ultimately did well.

My old friend and pupil, Mr. Folker, of Hanley, has not only kindly furnished me with the particulars of the following case, but also with the cast upon the table, taken from the patient's stump :—

T. H——, aged twenty-one, had his foot severely crushed by an engine and tender running over it on the 8th of November, 1865. Mr. Folker at once performed Pirogoff's amputation, removing about three-quarters of an inch of tibia and fibula. A small abscess formed, but speedily healed after being opened. In a month the patient was allowed to get up, and could bear some weight on the stump. He left the Infirmary on the 16th of December, able to walk without pain, the bones being firmly united. He is now following his former occupation of a coach-trimmer, and walks backwards and forwards to his work every day. He uses a walking-stick, but can do very well without it.

Mr. Henry Smith has also kindly supplied me with the following very interesting case :—

An artilleryman, aged twenty-six, had extensive disease of the right ankle-joint, for which Mr. Smith performed Pirogoff's amputation on the 8th of August, 1863. A remarkably rapid recovery took place, and in seven weeks the patient was well. Mr. Smith saw the man a year afterwards : the stump was well formed, not at all sensitive, and he could walk well by the help of a simple bucket apparatus applied to the leg.

My colleague, Mr. Canton, also performed Pirogoff's amputation in the case of a young lady, and with excellent results.

Dr. George Buchanan, of Glasgow, has likewise published a case in which he successfully performed Pirogoff's amputation upon a man whose foot had been crushed by machinery.

Mr. Shepherd, of Worcester, kindly informs me that he performed the operation upon a railway-guard on the 29th of October, 1864, for compound fracture of the tarsal bones, the os calcis alone remaining uninjured. Secondary hemorrhage occurred, and rendered amputation of the leg necessary. The man, however, recovered.

[Velpeau, in 1839, says in the second volume of his "Operative Surgery" that M. de Lignerolles had communicated to him a method of operating at the ankle-joint, whereby instead of the malleolar projections, a nearly flat broad surface is left. Leaving the astragalus, the os calcis must be removed with the foot. The flaps must be made from the sides of the foot, and be reflected towards the malleoli before the foot is disarticulated. In 1846 Malgaigne described his method, which is exactly that indicated by Lignerolles.]

He performed his first operation in 1845, and the following is his plan of proceeding, taken from the seventh edition of his Manual :—He obtained his flap from the inner part of the sole of the foot. Placing his knife over the tendo Achillis, he cuts through skin, tendon, and fat, down to the bone or upper surface of the os calcis ; he then continues the incision along the outside of the foot just below the external malleolus, turns it up over the dorsum of the foot a little in front of the medio-tarsal joint, then over the inner border of the foot, and across the sole of the foot for the inner two-thirds of its breadth. By this incision he divides every thing down to the bone. Then, transferring his knife to the inner extremity of the first incision (over the tendo Achillis), he cuts obliquely downwards, at an angle of forty-five degrees, on to the sole of the foot until he joins the other incision, thus completing his flap. This he reflects first from the sole of the foot, taking

condition as to emancipate it from this predisposition. Yet we find the following case reported by the high authority to whom I have alluded:—

"The ankle-joint appeared sound; the articulations on the inner side of the foot were sound; there were several fistulous openings on the outer side of the foot, and the probe found the outer side of the os calcis diseased. Another opening led to the diseased astragalus, and another to the cuboid. The disease appeared to be limited to the upper and anterior part of the os calcis, the anterior and outer portion of the astragalus, and the posterior of the cuboid. *The parts were gouged away*, and in so doing the large anterior synovial membrane between the scaphoid and cuneiform was laid open. The day after, severe erysipelas set in, followed by suppuration in the sole and inner part of the foot, and the patient became so weak that amputation of the leg was obliged to be had recourse to."

Now as I have not this dread of "predisposition," as I believe that caries of the tarsal bones frequently results from disease originating in the soft structures of the tarsal joints, and as frequently extends to the bones from mere contiguity of surface, and, moreover, that the removal without violence of the carious portion of a bone will frequently arrest the disease in that bone altogether, I should say that, circumstances contraindicating Teale's operation, the case just related was one to which subastragaloid amputation was especially adapted, when performed according to the method which I shall presently describe.

I would submit, moreover, that the operation may also be performed with great advantage in such cases as the following related by Mr. Skey. In Nov., 1858, he removed a considerable amount of diseased tarsal bones from the right foot of a patient. The case went on well for a month, when the disease returned, and in May, 1859, Mr. Skey operated again. In his clinical observations, alluding to the proportion of failures in these attempts (one in every three), he says it might have been preferable to have amputated, but that he desired to give the man a chance. As the ankle-joint does not appear to have been implicated, I should in similar cases prefer subastragaloid amputation in the first instance to gouging; and in the event of the latter having been tried and failed, I would certainly select the former rather than repeat the gouging or have recourse to amputation of the leg.

In one case, instead of taking the flap from the sole of the foot, Malgaigne obtained it from the dorsum. The patient, a woman, aged forty-two, had for three years suffered from disease extending from the scaphoid to the os calcis, but the ankle-joint remained sound. Gouging was had recourse to in the first instance, but the patient getting worse, Malgaigne operated by a dorsal flap. This sloughed away, but the wound ultimately cicatrized. The patient, however, subsequently complained that the weight of the body bore too much on the head of the astragalus, which in fact descended lower than the rest of the bone. By degrees she got over this, and when she left the hospital, in April, 1846, she could walk comfortably.

Maisonneuve appears to have performed the third subastragaloid amputation in France. He first cut the skin across at the posterior part of the heel; then bringing his knife forwards beneath the external malleolus, cut from behind forwards along the outer border of the foot to the roots of the toes, so as to make a flap involving the skin of the entire dorsum of the foot. The flap united, but the patient subsequently suffered greatly in walking, from the pressure on the head of the astragalus, which descended lower than the malleoli, the posterior part of the bone being apparently drawn up by the contraction of the tendo Achillis.

M. Malgaigne also relates the case of a soldier operated upon before Sebastopol, in whom the astragalus, drawn up behind by the tendo Achillis, became anchylosed to the tibia, and thus prevented the stump resting flatly on the ground.

In the year 1848, Mr. Simon introduced the operation into this country in the case of a boy aged fifteen, suffering from scrofulous caries affecting the front and outside of the tarsus, extending to the os calcis, but sparing the astragalus. Having ascertained that the astragalus and ankle-joint were

healthy, Mr. Simon made his flaps as in Syme's amputation and, introducing his knife between the astragalus and calcis by cutting from before backwards, detached the foot. The boy recovered with a good and useful stump; and, when seen several years afterwards, could walk well and without inconvenience.

Mr. Simon's second case was not so successful, although the fatal termination can scarcely be ascribed to the operation, performed on a railway labourer, aged twenty-five years, admitted into St. Thomas's Hospital in the summer of 1853. A carriage-wheel had passed obliquely over his foot from behind forwards and inwards, crushing everything in front of the line of the incision, and breaking and exposing the under part of the os calcis. The same amputation was performed as in the former case. The stump was nearly healed, and was apparently as satisfactory as could be wished, when about a fortnight after the operation, the patient died of tetanus.

Both Malgaigne and Maisonneuve allowed the head of the astragalus to remain; and we are led to infer that Mr. Simon pursued the same practice. In the two former instances we have seen that great suffering and inconvenience follow this practice, resulting from the tendo Achillis forming fresh attachments, and drawing the posterior portion of the astragalus up into the mortise of the tibia and fibula, by which the head of the bone, rendered unduly prominent, was forced downwards; so that the patients in walking rested on this process instead of upon the broad under surface of the bone, as they should have done. This inconvenience may be entirely prevented by removing the head of the astragalus at the time of operation, which can be done with perfect safety, and certainly a much better stump results from such proceeding.

On the 24th September, 1863, the girl a portion of whose foot I had amputated by sawing through the cuneiform and cuboid bones, and whose case I alluded to in my second lecture, was readmitted with inflammation and pain in her other (the right) foot. The right ankle-joint appeared to be much swollen and inflamed, especially over its anterior and outer aspect. Entire rest upon a splint was ordered. The joint, however, still remained swollen, thickened, and painful, and at length the skin on the outer side ulcerated. Under tonics and nourishing diet, with perfect rest, the patient appeared to improve; but at the expiration of six months she became rapidly worse; several wounds opened in the neighbourhood of the joint, instep, and beneath the sole of the foot, with sinuses leading to the bones in various directions. As her general health was now giving way, I, in March, 1864, recommended the girl to have the foot removed at the ankle-joint; and she having consented, I proceeded to perform that operation. But a more careful examination under chloroform led me to doubt the necessity of sacrificing the ankle-joint. I consequently made an exploratory incision on the outside of the foot, and with my finger found that the astragalus was sound, whilst the freedom with which the foot could now be flexed and extended showed also that the ankle-joint was free from implication. Under these circumstances, with the consent of my colleagues, I determined upon performing the subastragaloid amputation by flaps as in Syme's operation, differing only in making the posterior flap fuller than that advised in the latter proceeding. In consequence of the amount of disease in the os calcis the soft parts had become detached, so that very little difficulty was experienced in separating the posterior flap from the bone, or in subsequently introducing the knife between the astragalus and calcis and cutting the interosseous ligament. Having thus detached the whole of the foot with the exception of the astragalus, I next removed the head of the astragalus, sawing through the neck of the bone, and bringing the flaps together, united them by two or three sutures, taking care to leave the angles unclosed so as to admit of free discharge. The stump healed gradually and without a single untoward symptom. The patient's health slowly but surely improved, and at the end of three months she was discharged, being able to bear her weight upon her stump and hobble about upon crutches. After a few months Mr. Ernst, the surgical mechanician, fitted her with artificial feet; and she is here in the college today for the purpose of being examined, if you, sir, and the rest of my hearers

would desire to do so. You will find that both the stumps are entirely healed, and sound. It is now more than two years since the last operation, and nearly three since the first. Notwithstanding the amount of disease in the tarso-metatarsal joints, and the proximity to those joints at which I sawed through the tarsal bones, as you have already seen in the preparation before you, the stump has remained sound to the present day, and in the condition in which you will now find it. The stump resulting from the subastragaloid amputation appears to me to be perfect. It is round and of good form; the cicatrix is firm and well up in front; and the bottom of the stump is properly covered by the natural heel-tissue. She has a certain amount of motion of the ankle-joint, and can now walk with the assistance of a single crutch. Not, as she will tell you, that she requires the crutch from inability to bear her weight upon the stumps, but because, as she says, the loss of the front of her feet causes such a strain upon the lumbar muscles when she walks without the crutch that she is prevented doing so by the pain referred to that situation.

Subastragaloid amputation appears to have been performed up to this time in twenty-two cases. By M. Malgaigne six times, by M. Maisonneuve once, by M. Nélaton once. M. Vacquez has collected nine other cases, all of which are stated to have terminated favourably. In Scotland, Dr. John Traill, of Arbroath, performed it once successfully. In England, Mr. John Simon has performed it twice, once successfully, and in the other case the patient died at the end of a fortnight of tetanus. Mr. Garner, of Stoke-upon-Trent, operated in one case, but he does not report favourably. And, lastly, I performed it once, in 1864, successfully.

Thus we have three amputations connected with the ankle-joint; first, Syme's, removing all the bones of the foot, furnishing an excellent stump, but the shortest limb; Pirogoff's, removing all the bones of the foot except the tuberosity of the os calcis, also supplying an excellent stump, and a limb as much longer as the quantity of os calcis preserved; and, lastly, the subastragaloid amputation, by which the astragalus and ankle-joint are saved, and an equally good stump and length of limb are bestowed on the patient as by Pirogoff's method. Good, however, as the subastragaloid amputation may be, and satisfactory as have been the results in the case just related, it has seemed to me to be capable of improvement in two essential points—namely, first, in the length of the limb, and, secondly, in the amount of leverage afforded by the astragalus for the artificial foot, and the consequent effects upon the movements of the ankle-joint. It therefore struck me that cases might occur in which, whilst the astragalus remained sound, disease or accident involving the other tarsal bones might only extend to the anterior portion of the os calcis; as in the first of the cases of Mr. H. Budd, of Worcester, in which the astragalus and os calcis alone remained uninjured, and the sound integuments were too scant to admit of a Chopart's amputation; and that in such cases a modification of subastragaloid and Pirogoff's amputation might be beneficially introduced to the notice of the profession. I proposed, in fact, to leave the ankle-joint intact, to remove the head and under surface of the astragalus, and, removing the whole of the os calcis with the exception of its posterior third, to bring that portion and adapt it by its cut surface to the under surface of the astragalus. On mentioning my views to my colleague, Mr. Canton, he not only entered into them warmly, but, with that courtesy for which he is proverbial, offered me the first case which he might have to which the proceeding could be applied. He kept his promise, and by his great generosity I am now enabled to present you, not merely with a theoretical description, but with a living proof of the success of an operation which has never, I believe, been performed before, either in this or in any other country.

The patient, aged twenty-four, a native of Ayrshire, about twenty years ago, during the winter, observed that his great toe became swollen and inflamed. He did not attach much importance to this at the time, as others of his family had their feet and toes similarly affected, caused, as it was supposed, by frost; therefore no especial notice was taken of his condition until the others had got better. After continuing some time in this swollen state,

matter formed, which discharged by three openings, all, as it were, connected interiorly. It next suppurated at three places on the back of the foot, extending in a straight line from the great toe as far as the instep. Under treatment, however, these parts gradually healed up, and have remained so. For a considerable time, it might be two or three years, the disease was confined to the toe, and the peculiar excrescence was formed and gradually increased, but gave him little pain, so that he could go to school, or do what he was able about a farm of ninety acres which his father tenanted, with slight inconvenience, although there was always more or less discharge. The next suppuration was towards the outside of the foot and near to the toes; it gradually formed into an excrescence similar to that on the toe, but was removed by means of caustic, after which it quite healed up. By-and-by, however, new wounds were formed round where the others had been, which remained until the operation. About twelve years ago the disease in the sole of the foot commenced, and since that period there have been several abscesses on the leg at different times and in various places, all of which, after festering, soon got well under treatment, and there has been no disease save in the foot for several years. Until the last two years the disease had not materially interfered with his walking, but since then it has become much more troublesome from an acute pain in the region of the heel and ankle. He has always lived in the country, and enjoyed pretty good health except when the matter was forming. He is the youngest of six sons, and has two sisters younger than himself, all healthy and strong. His father died at the age of seventy-six, and his mother is still alive, and the relations of both are strong and healthy people. In the winter of 1864–5 the little finger of the hand on the same side as the diseased foot became similarly affected, and has remained so ever since.

When admitted into Charing-cross Hospital the patient presented a well-marked example of the fair variety of scrofula. The foot was generally swollen and somewhat distorted. The soft parts have a brawny hardness. The great toe is so enlarged and misshapen as to appear elephantoid. In front of the ankle-joint, and particularly on the dorsum of the foot, there are many larger or smaller ulcerated openings, which gave issue to a strumous form of pus, without, however, such odour as would indicate the existence of diseased bones, nor does examination with a probe show that these latter are affected. All the joints seem to be perfect, and it gave him no pain or inconvenience when they were moved.

No plan of treatment, either local or general, having ever been of any avail, it was decided that the disease should be removed by operation; and, as I have before said, Mr. Canton most kindly allowed me to carry out my proposition, assisted by himself and my two other colleagues, Messrs. Hird and Barwell.

The patient having been placed under the influence of chloroform by Mr. Marshall, I commenced an incision beneath and at the posterior angle of the external malleolus, and carried it forwards along the outer border of the foot to a point about half an inch anterior to the projecting base of the fifth metatarsal bone. I then made a second incision along the inner border of the foot, commencing posteriorly about the centre and beneath the internal malleolus, and terminating anteriorly at a spot corresponding to the termination of the external incision, and then united the two by a third and semilunar incision, carried, with its convexity directed towards the toes, across the front of the sole of the foot well down to the bones. Reflecting this flap back as far as the projections on the under surface, and in front of the tuberosity of the os calcis, I carried a fourth incision across the dorsum of the foot, immediately behind the head of the astragalus. Then, applying a saw upon the under surface of the os calcis as far back as I could, I cut through the bone obliquely from below upwards and backwards. Next, resuming my knife, I entered the mediotarsal articulation, and, passing the instrument under the head of the astragalus, and cutting from before backwards, in the direction of the anterior articulating surface on the os calcis, divided the interosseous ligament, and detached the front of the foot. I then sawed off the head of

the astragalus, and with a pair of bone cutters (curved on the flat) removed the two articular cartilages on the under surface of this bone, and securing the two plantar arteries, thus completed the operation. The flaps were brought together by three wire sutures in front, the lower angles of the wound being left open. The patient has gone on remarkably well ever since. There has been no suppuration in the course of the tendons, no secondary hemorrhage, nor any constitutional disturbance. A very few days after the operation he said he was much more comfortable than he was before it was performed. As I believe the operation to be original, I have ventured to designate it in the table before you as my own.—*Lancet, June* 23 *and* 30, *Aug.* 4, *Sept.* 1 *and* 8, 1866, *pp.* 678, 705, 115, 227, 257.

29.—ON FRACTURES OF THE TIBIA AND FIBULA.

[The following article is from a report on the treatment of fractures in the London Hospitals, published in the Medical Times and Gazette.]

FRACTURES OF THE TIBIA.

Fracture of the Head of the Tibia into the Knee-joint.—This, unassociated with fracture of the condyles of the femur or compound fracture into the joint, is a comparatively rare accident. The treatment generally adopted for it is simply that of laying the limb out straight on a back splint and raising it, so that the muscles acting on the joint may be relaxed. In order to keep the joint at rest, gutta-percha, leather, or pasteboard splints may be applied to the sides of the knee. The limb should then be swung. Passive motion may be commenced in about a month or six weeks.

Fractures of the Shaft of the Tibia.—In cases of fractured shaft, where the displacement is, if any, slight, after the fragments have been accurately adjusted, the limb is put up immediately by some surgeons in plaster of Paris or starch bandages, the methods of supplying which we have already described in a former paper. This early putting up of fractures in the stiff apparatus should only be had recourse to when, as we have before observed, the displacement is slight and the integuments are not severely bruised.

With regard to the splints and contrivances in use for putting up the more complicated forms of fracture, we can only say that we have seen those of the most simple possible construction; these, and the methods of fixing them to the limb, we now proceed to describe. We mention them here particularly with the tibia, as it is in fractures of that bone that they are most frequently used; but it will be seen that the same methods apply equally well to fractures of the fibula, or of both bones together.

In cases, then, of fractured shaft, when the fragments have been placed in apposition (which they may be judged to be, when the ball of the great toe is in a line with the inner border of the patella), a very common method of putting the fracture up is that of applying two side splints with foot pieces to either side of the limb. These, having been of course previously well padded, may be kept in position by taking a turn or two of bandage, first round the foot and ankle, and then round the foot-piece. The bandage should not be continued the whole way up the limb, as it is of importance in all cases of fracture that the actual seat of injury should be exposed to view; a few turns round the upper part of the leg-pieces will be sufficient to retain the splints in position. The limb may either be swung or placed between sand-bags; if the latter, a wire cage should be put over it to keep off the pressure of the bed clothes. These splints may be either hollowed out or plain. Sometimes only a single side splint with a foot-piece is applied to the outer side of the limb, the leg being slightly flexed, and placed on its side.

McIntyre's iron splint, or Liston's modification of it, is much used in some hospitals. Care should be taken in applying the splint, that it be thoroughly well padded throughout, and that cotton-wool or tow be inserted between it and any of the soft parts that may be subjected to pressure. No part of the splint should press upon the heel, as this part of the foot frequently becomes

ulcerated from the carelessness with which this splint is applied. In applying it, after the foot and ankle have been carefully bandaged to the foot-piece, and the thigh to the thigh-piece, it is not necessary to cover the limb entirely with bandage. The apparatus should be swung either from a common cradle or Salter's swing. Mr. Erichsen says, "In some cases of fracture of the bones of the leg, however, McIntyre's apparatus is not applicable. This is more particularly the case when the fracture is very oblique, from above downwards and from before backwards. Under these circumstances, the fragments cannot be got into good position, so long as the limb is kept extended and resting on its posterior surface, the bones riding considerably, and one or other of the fractured ends pressing upon the skin in such a way as often to threaten ulceration." In some hospitals, in addition to the two splints above mentioned, a back splint, with a foot-piece (capable of being fixed in the required position by a screw) corresponding with the sole of the foot, and with the leg-piece extending as far up as the ham, is used. The splints may be retained in position either by bandage or fillets.

At St. Bartholomew's, Mr. Paget uses the following method:—The limb is placed upon an ordinary iron back splint; to this it is secured at the foot and knee by means of wide pieces of gutta-percha moulded to the shape of the limb, and laced under the splint by narrow tape. Two straight wooden side splints are then applied; these are buckled together at their lower extremity (which is exactly on a level with the sole) by means of a thin leather strap passing across the sole from one to the other. In the remainder of their length, which reaches up the thigh to the same point as the back splint, they are fastened more or less tightly, according to the degree of lateral pressure which it is thought advisable to apply to the limb, by two or three webbing straps and buckles. The leg is then "swung" in the usual manner. It will be seen that this way of putting up fractures of the leg recommends itself by its simplicity, and, if the term may be allowed, by its conciseness. No bandage at all is employed, and the limb is left wholly free from all pressure that can interfere with the circulation. The exact condition of the limb, and the relative position of the fragments can at any time be ascertained, and as the side splints are fixed independently of the back splint, they can be removed either during occasional sponging of the limb, or for any other purpose.

In cases of oblique fracture, with projection of the lower end of the upper fragment, the management of which is generally very difficult, Mr. Hutchinson finds that the simple expedient of raising the leg obviates this trouble.

Fracture of the Inner Malleolus.—Side splints, or a single splint applied on the opposite side to the fracture.

FRACTURES OF THE FIBULA.

Fracture in the Upper Part.—The displacement here generally is so slight that plaster of Paris or dextrine bandages may be used at once, or the limb may be placed in McIntyre's or side splints.

Fracture of the Lower End, or Pott's Fracture—the foot being dislocated outwards, and the tip of the inner malleolus broken off, or he internal lateral ligament ruptured.—The most general method is to put the limb up on a Dupuytren's splint, which is like a short Liston's splint with a couple of notches at the lower end, through which the bandages pass to produce slight extension.

In applying this apparatus, which is adapted to the inner side of the leg, care must be taken to pad the splint well, especially opposite to the seat of fracture, which padding should fill up the hollow formed by the curve of the leg as it lies on the splint, and so act as a fulcrum over which extension can be made. A few turns of bandage should then be made round the foot and through the notches. The bandages should not be continued up higher than the ankle, and the upper part should be bound securely to the leg just above the calf. Sometimes an ordinary side splint with a foot-piece is used, but it should be carefully padded in the way mentioned above, as the object to be attained is the throwing out of the upper end of the lower fragment. After union the dextrine or plaster of Paris bandage should be applied.

Fractures of both Bones.—Any of the above-mentioned splints are in general use. A very simple method we saw in use at the *Dreadnought* Hospital ship, in cases of fracture of both bones. It is very easily applied, and can be readily taken down without disturbing the setting of the fracture. A piece of stout sheeting is to be rolled in opposite directions, so that two pillows or junks are formed by the rolled extremities; upon this the patient's limb is laid. Then a fillet is passed behind the sheeting, and similar ones under the limb. Next two well padded side splints, with foot-pieces, are adapted to either side of the leg, and secured by buckling the fillet passing under the leg. Next the external sheeting is rolled up in opposite directions, until the rollers correspond with the outside of the splint, and the fillet under it buckled over all. The foot may be secured to the first piece by a turn of bandage. Hester's apparatus we have seen very generally used in the Westminster Hospital. In Mr. Heath's valuable work "On Minor Surgery" is the following account of the manner of applying it. He says, "It combines the advantages of the side splint with those of the swing, as the splint is suspended from rollers and a cradle, which allow of the free movements of the patient. In making use of it, the knee is first firmly fixed, a pad being placed below the tubercle of the tibia, and another above the head of the fibula, the foot being well strapped to the footboard. Extension is then made by means of a screw underneath, and thus shortening is effectually prevented, whilst the side splints, when screwed on, keep the limb perfectly steady."

We lately saw, under the care of Mr. Hutchinson, in the London Hospital, a child, about four years old, who had, in falling, broken both bones of the leg, and we were told that a second case of the same kind had a short time previously been under treatment. The limb was put up in splints, and "swung" in the usual way. This accident is so rare that it deserves to be mentioned. Every one must have observed that while in adults fractures of the bones of the leg are much more common than fractures of the femur, in children just the reverse is the fact. Fractures of the femur are very common, indeed much more so than in the adult, while fractures of the leg are very rare. We have often asked for an explanation of these facts, but have not yet met with one that is altogether satisfactory. It seems probable that they depend to some extent on the different way in which children and adults fall, the former generally coming to the ground with the legs doubled under, so that the weight of the body falls, through the knees, on the femur, while adults more commonly sustain fracture while the weight of the trunk is being transmitted to the ground through the bones of the leg.—*Medical Times and Gazette, June* 23, 1866, *p.* 662.

30.—ON THE OPERATION OF TREPHINING IN CASES OF FRACTURE OF THE SPINE.

By Dr. Robert M'Donnell, F. R. S., Surgeon to Jervis-street Hospital; Lecturer on Surgery in the Carmichael School of Medicine; Examiner in Surgery in the Queen's University.

[The operation of trephining the spine in any case whatever has practically been set aside for many years past, but the writer of this paper knows that there are many who coincide with him in thinking that the operation should be acknowledged in certain cases to be justifiable. Dr. M'Donnell has now seen the operation performed three times on patients, and he has performed it many times on the dead subject.]

In the lumbar region and lowest part of the dorsal the operation offers the greatest difficulties. The patient should be placed face downwards, with the feet towards the window, so that the light may fall into the bottom of the wound. The body should be placed as evenly and flat as possible on its front aspect; but the person who gives chloroform can keep the head turned a little on one side, and somewhat raised, by placing one of his hands under the chin. An incision from four to five, or six, inches long is to be made through the integuments over the spines, with a strong scalpel. A strong

curved bistoury is the best instrument with which to divide the muscles on each side of the spinous processes; and this can be done, at once, more rapidly, and closer to the bone, by entering the point of the bistoury below and cutting upwards and backwards. As soon as the mass of muscles on each side are to a sufficient extent divided, the operator should fix, himself, on each side, a retractor, and give each in charge to an assistant. The broad flange of such a retractor not only keeps the wound well open, so that the operator can see what he is about, but by pressure prevents hemorrhage, while the hand of the assistant who holds it does not get fatigued, owing to the other end being bent. The operator should next feel in the sulcus, on each side of the spinous process, for the inequality caused by the injury, and by grasping successively each spinous process, in a pair of necrosis forceps, ascertain whether the posterior portions of any vertebra are broken. He must then determine which laminæ are first to be divided; and before doing this it is well to place sponges, wet with iced water, in the hollows on each side of the spinous processes, and give time for all hemorrhage to cease.

Having singled out the spinous process of the vertebra, the laminæ of which are to be divided, the interspinous ligaments above and below it are to be cut, and a part of the process taken off, with bone forceps, leaving, however, enough to grasp with the necrosis forceps, when it becomes necessary to remove that portion, after division of the laminæ. The division of the laminæ, in this region, is exceedingly difficult. The trephine cannot be used; and Hey's saw, owing to the depth of the wound, and oblique manner in which the bone must be sawn, is also useless. The division is best accomplished by strong forceps bent at an angle, something like the forceps known as "Fergusson's side-cutting forceps." Experience shows that the laminæ may be thus cut through without fear of injuring the cord or its membranes. As soon as this has been accomplished, the portion of the spinous process still remaining is to be caught in a pair of necrosis forceps, and the portion of bone raised and removed by carefully dividing the ligamentous structures still holding it. When the posterior arch of one vertebra has been taken away, the removal of the second is comparatively easy; the best method of effecting this is by nibbling it away bit by bit, with the ordinary gouge forceps.

It is a much easier matter to remove a spinous process, and the laminæ on each side of it, in the middle or upper part of the dorsal region than in the loins. In its preliminary stages the operation is like the foregoing. When the muscles on each have been divided and retracted, as already described, owing to the mode in which the spinous processes of the dorsal vertebræ are imbricated one over the other, it becomes necessary to remove the spine above that which, with its laminæ, is to be first taken away. This having been done the spinous process of the vertebra, the laminæ of which are to be divided, should be taken away, as close to the root as possible, with gouge forceps. With a little care the spinous process can be so completely taken off as to leave the surface sufficiently flat for the application of the crown of a trephine, which should in general be about one inch in diameter, and furnished with a strong centre pin, a little longer than usual. As the bone is of a much softer texture than that of the cranium, the trephine once planted, works rapidly, so that after a few turns the centre pin should be withdrawn, and it should then be worked gently until it is found possible to move, and subsequently elevate, the trephined portion; after this is taken out it will be seen that in the dorsal region there is a sort of provision which enables one to use the trephine without much danger of its, in any way, injuring the cord. In fact the articulating process of the vertebra, next below, looks backwards in such a way as to prevent the instrument from going suddenly in so as to injure the medulla. The posterior arch of a second vertebra may now be easily taken away, either by a second application of the trephine, or better still, by the aid, simply, of the gouge forceps.

In the cervical region the removal of the bone can be effected with great facility by the gouge forceps alone; here, as well as in operating on the first dorsal vertebra, the trephine cannot safely be employed. After the skin has been divided and the muscles detached on each side the interspinous liga-

ments are to be cautiously cut, taking care not to sink the scalpel too deeply; the spinous process is next taken off with the gouge forceps, and at once the ligamentum subflavum comes into view, and the vertebral canal is opened to a small extent. Bit by bit the posterior arch is then to be taken away by the gouge forceps, until enough is removed. The removal of a second or third can be even more readily accomplished with the same instrument. The retractors employed for holding back the muscles on the neck should not be so broad as those intended for the operation on the back or loins, and the lower edge of the retracting flange should be somewhat convex.

In all the cases which I have seen the wounds have gone on favourably under the simplest treatment; water dressing at first; and after suppuration has become established, charpie, with simple dressing, or a poultice with some "warm dressing" under it.

It is unnecessary to say that every possible attention must be paid to the general health of the patient. He should be placed on a water bed, the bowels and bladder carefully attended to, and any tendency to bed-sores guarded against with the utmost anxiety. For this purpose he must be shifted from side to side, and occasionally placed upon his back, even at the risk of pain in the wound or disturbance of the vertebra. To avoid bed-sores and keep the bladder in good order must be the first object of the surgeon, and no entreaties or complaints should influence him in deferring to do what he considers necessary for this purpose. The bed clothes must be frequently changed, and kept perfectly dry. If any bed-sores have already formed, every effort should be made to get them cured; if the urine is already alkaline and muco-purulent the bladder should be washed out every day, or several times each day.

Immediately after the operation the object of medical treatment should be to avoid inflammation of the cord or its membranes, and with this view belladonna or atropia should be administered, with the intention of keeping the medulla as much as possible in a condition of repose; opium should not be given; but if urgently demanded to allay pain it should be joined with belladonna, in doses proportionally large. Somewhat later iodide of potassium may be ordered, and when all apprehension of inflammation is past, strychnine. Indeed, it will be in different cases a very nice and at the same time a very important question to determine whether it may not be good practice to give strychnine early, even at the risk of calling forth inflammatory action in the cord. Of course, its administration would not be contemplated if any tendency to myelitis can be detected. But if pressure on the medulla for a longer or shorter time has given rise to that kind of mechanical softening of it which, without being identical with white or atrophic softening, is closely akin to it, and if it seems that the parts below are not recovering their vital powers after the pressure has been got rid of, it may become necessary to make a desperate effort to rouse the dormant energies of this portion of the marrow, regarding the chance of exciting inflammation of it as the less great danger of the two. Under these circumstances I should not hesitate to give strychnine cautiously before many days after the operation.

Shampooing of the limbs and the use of electricity should be early applied in order to arrest the atrophy of the muscles. Whatever doubt may exist as to giving strychnine at an early period after the operation there need be none about its administration after the risk of inflammation is past; it should then be added to good nourishing diet, with wine, beer, and iron tonics.—*Dublin Quarterly Journal, Aug.* 1866, *p.* 31.

31.—ON THE REDUCTION OF DISLOCATIONS, MORE ESPECIALLY OF THE HIP AND SHOULDER, BY MANIPULATION.

By Thomas Nunneley, Esq., Leeds.

[Hitherto, reduction of dislocations of the hip-joint by manipulation has never been attempted except after failure of the ordinary methods of treatment. Even Dr. Reid, of Rochester, United States, to whom is owing the

honour of first introducing reduction by manipulation as a legitimate plan, only speaks of reducing dislocations on the dorsum ilii and into the ischiatic notch. Mr. Nunneley believes manipulation to be as applicable not only to the two other forms of dislocation to which the hip joint is liable, but equally so to all those to which the shoulder-joint is subject. Mr. Nunneley continues:]

The most important condition to be insured is a *relaxed, but not perfectly helpless, flaccid, uncontractile condition of the muscles;* as it is by the contraction of the muscles, which are attached near to the head of the dislocated bone, that reduction is mainly accomplished. The importance of constantly bearing this in mind I cannot too strongly impress upon those who may feel inclined to attempt the plan of reduction by manipulation. If the muscles, which are more immediately concerned, be in a state of active, rigid contraction, as they commonly are after a dislocation has existed for a short space of time, and the patient has recovered from the immediate shock of the accident, they will almost inevitably prevent those movements of the bone which are essential for its being brought into a position for slipping into the socket, whence it has been removed; while, on the other hand, if they be incapable of any contraction whatever, it will frequently be found to be impossible for any manipulatory movements of the surgeon to replace the bone; or, being replaced, for its being retained in its position. I feel confident that I have seen both of these causes materially interfere with success, particularly the latter one, when the muscles have been entirely paralysed, owing to the anæsthesia having been rendered too profound. In the wish to prevent any muscular resistance whatever, the necessity for some contractility has been forgotten, or not understood. If the patient be still suffering from the shock of the injury, sickness, drunkenness, or, from age or any other cause, be in a depressed condition, he will hardly require to be put under chloroform or any other anæsthetic; but, on the contrary, if the patient be young and vigorous, if the muscles are in strong contractile action, or have been shortened by the loss of their normal opposing resistance, particularly where the dislocation is of long standing, or where there are adhesions to overcome, then the anæsthesia should at first be sufficiently profound to allow of free manipulatory movements being effected, so as to have overcome all such resistance by the time returning contractile power in the adjuvant muscles may be ready to pull the bone into the socket.

As the first commencement of manipulation, particularly in cases of recent date, the movements made with the limb should be very gentle, not rough nor abrupt. The limb should be well flexed: then, when all the muscles are relaxed as much as possible, and, so to speak, thrown off their guard, the limb should be suddenly and rapidly, but not violently, rotated on its axis, and completely abducted or adducted, as the case requires, and at the same time depressed or raised, when the adjuvant muscles will be perceived to rapidly contract. Thus the bone is partly pushed by the surgeon, and partly pulled by the muscles attached near to its neck into its place. A snap is commonly, but not invariably heard; and the reduction is accomplished. This, I believe, can only be rapidly and brilliantly accomplished under the muscular conditions which I have indicated.

The sound heard, and the impression made upon the surgeon's sense of touch, on the slipping of the head of the bone into the socket, are so peculiar, that I do not think he will often be deceived as to whether the reduction has been effected or not, after he has once successfully accomplished it.

I need hardly detain the members by any very minute description of the precise manner of proceeding in each form of dislocation, as this must necessarily be varied to some extent with each form of dislocation, and must be guided by the surgeon's own knowledge of the anatomy of the joint; the object being, I would merely say, to use the limb as a lever to bring its displaced head into as near a position to its socket as is possible; at the same time calling into action those muscles which will immediately act upon it in pulling it through the ruptured capsular ligament into the socket, and at the same time relaxing those which may have a contrary effect.

As a rule, I think the patient should be laid on his back upon a mattress

placed upon the bed, the floor, or a large table, so as to be firmly supported. When the muscles are thought to be sufficiently relaxed, and the patient is quite quiescent, the surgeon, supposing the dislocation to be on the dorsum ilii, or into the ischiatic notch, should mount upon the mattress, and, standing above him (if it be a dislocation of the shoulder, standing beside the patient on the affected side will be the proper position), quietly seize, with both hands, the leg of the dislocated limb; gently flex it upon the body; adduct it; then quickly rotate the head of the bone, which brings the muscles into play; and, almost at the same instant, suddenly and forcibly abduct the limb and bring it down into an extended position, when, if the movements be successful, the reduction is effected. If the head of the bone be in the ischiatic notch, while the movements will be of essentially the same character, the flexion will be required to be somewhat less than when it is high upon the dorsum; while the abduction, as the limb is rotated, must be more forcible, or the head of the femur will not be lifted out of the notch over the high edge of the acetabulum; and care, as has already been said, must be taken, or instead of passing into the cavity, it will be thrown into the thyroid foramen. Should the dislocation, whether primary or secondary, be on this foramen, the movement must be one of full adduction, instead of abduction, so as to bring the head of the bone near to the socket.

Though this plan of reducing dislocations has been spoken of as one more especially adapted for cases in which the head of the bone is in the ischiatic notch, I believe it will be found that, in this position reduction by manipulation will be more difficult, and more frequently fail, than in any other form of dislocation to which the hip is liable.

I may just add that, of anæsthetics, I prefer the Dutch liquid (chloride of olefiant gas), or the bromide of ethyle, to chloroform; as, amongst other advantages, they both seem to me to have decidedly less tendency to induce muscular contraction and that violent struggling which chloroform so commonly induces before the system is brought fully under its influence, and which it is of importance to avoid, as the more quiescent the muscles are the more easily and readily will reduction be accomplished.—*British Medical Journal, Oct.* 20, 1866, *p.* 434.

32.—ON DISLOCATION AT THE SHOULDER JOINT.

By Dr. G. Hamilton, Falkirk.

[The difficulty in reducing a dislocated shoulder is frequently that it is impossible to fix the scapula whilst extension is made. Many plans have been recommended and tried, such as putting the arm through a common ladder, putting a transverse bar in the axilla, and placing the patient in a high-backed chair with his arm extended over the back.]

About two years since, I met with rather a difficult case, in the person of a large-bodied and very muscular man, in which I took advantage of a huge arm-chair, with a strong high back, which I found in the house. On this I placed a pillow, for the axilla to rest upon, and with the assistance of two strong men I reduced the dislocation very satisfactorily. Another followed, shortly afterwards, where I had no suitable arm-chair, but where I found a common screen for drying clothes, and this, with the pillow, also did very well. In a third case, neither of these being at hand, I mounted the patient on a table, placed the axilla on a pillow on the top of a door, and succeeded equally well. About six months since, I had, unfortunately, to make personal acquaintance with this accident. In passing over a railway bridge, my horse took fright at a passing train, and came down with me. In stretching out my right arm to save myself, dislocation at the shoulder took place, of which I was immediately made aware by the ugly tearing sensation that occurred. Fortunately, a house was near at hand, in which I received shelter. Without losing a moment, I looked about for some suitable apparatus with which to effect reduction. Finding nothing better, I got a narrow table, on which I placed, on its side, a long narrow stool, such as is found in cottars' houses.

On the top of this I had a pillow placed, on which I rested my axilla, my body being placed between the two feet of the stool. Two strong men, who were at hand, kindly lending their assistance, reduction was effected after a few minutes' traction. I was so much pleased with the results in these instances, that I was thinking of having constructed a suitable apparatus which I could keep by me for use in such dislocations, when I cast my eyes upon a set of painter's steps, which immediately struck me as precisely the article I wanted. I have used this now in three cases, and its use seems to me to give very considerable advantages over the modes of reduction generally employed.

The "steps" I use are 4 feet 10 inches high, and the moveable support should be fixed with an iron rod, and not with a rope, as is often the case, as the former secures a greater amount of steadiness. A pillow is laid across the top step, and the patient ascends as high as may be convenient, of course placing the axilla on the top of the pillow. One or two assistants now lay hold of the arm, drawing, at first, steadily outwards and slightly downwards, traction in the latter direction being gradually and cautiously increased by approximating the arm to the steps. Reduction, in all the cases I have had, has been effected easily, and even, if I may use the expression, elegantly, but none of the dislocations had remained unreduced for more than twenty-four hours. The great power that we here possess, however, seems to me to render it highly probable that, in cases of longer standing, this simple apparatus will also be found very efficacious.

The three agencies mainly to be relied on in ordinary cases of shoulder-joint dislocation are evidently extension, counter-extension, and leverage, and especially the combination of these. When the dislocation has remained long enough unreduced for adhesions to form, perhaps, also, the putting in practice preliminarily some such manœuvre as Sir Astley Cooper saw the Lancashire bone-setters use, where they rapidly whirled around the arm before attempting reduction, may be of importance to the operator.

In using the "steps," their height is very convenient for exercising extension, while the counter-extension required is made to a great extent by the weight of the patient's body, the rest being easily supplied by the foot of an assistant. The height, again, is very important in exercising leverage power, and its amount at command is enormous, and of course requires caution in its use. In laying hold of the arm of a person placed in position for experiment, I have the feeling that I could with ease, if I wished, produce either dislocation or fracture of the humerus. Here, also, the combination of these powers is easy and natural, simply by causing the assistants to approximate the arm to the steps. Almost all our best surgeons have dwelt upon the importance of employing leverage in these cases, and yet the usual modes of reduction supply this very inefficiently. The heel in the axilla, or the knee of an assistant, gives us but little; while, when the pulley is employed, leverage power, from the points of extension and counter-extension being fixed, is necessarily lost altogether. To remedy this, I recollect seeing Mr. Liston, as he recommends in his "Operative Surgery," endeavour, with a towel under the patient's arm, to *lift up* the head of the humerus; but the power given by this means is evidently very slight compared with such leverage as can be got in using the "steps." With these, even should the pulley be used, leverage could easily be combined with extension, by gently moving the steps forward; or, perhaps, this might be done more effectually and continuously by having wheels attached to the steps.

In brief, this modification of the usual modes of reduction of these dislocations, which I have proposed, seems to possess the advantages,—

1st. Of enabling the surgeon to dispense with his personal exertions.

2nd. It gives an amount of power in extension and leverage limited only by a considerable of the resistance possessed by the tissues; and it also enables the operator easily and naturally to combine these powers.

3rd. The position of the patient gives perfect freedom for the administration of anæsthetics, if such should be wished or required.—*Edinburgh Medical Journal, Sept.* 1866, *p.* 248.

33.—ON THE CURE OF CLUB-FOOT WITHOUT CUTTING TENDONS, AND ON CERTAIN NEW METHODS OF TREATING OTHER DEFORMITIES.

By Richard Barwell, Esq., Assistant-Surgeon Charing Cross Hospital.

[Mr. Barwell considers that tenotomy is at present used to an extent which is unreasonable in theory and unsatisfactory in its results; and, as patients shrink so much from being cut, it is our duty to carefully consider any mode of practice which professes to accomplish, without an operation, that which has hitherto required the use of the knife.]

If we look at an ordinary case of *talipes valgus*, or splay-foot, we can hardly fail to be struck with the appearance of weakness and relaxation which the whole ankle and foot present. There is evidently a want of proper force and tone in the tissues. Such being the case, it certainly seems unreasonable to divide the contracted tendons—which is in effect to paralyse those muscles which still retain their contractile power—and yet the free division of the tendons, and the application of a "Scarpa's shoe," is the treatment which is commonly recommended in these cases. Now, it is the soundness of such practice as this that Mr. Barwell calls in question.

It will be observed that we are speaking of those cases of club-foot which depend upon paralysis, and we apprehend that they form the largest class with which the orthopœdist has to deal. Assuming, then, that the common cause of the deformities which we are considering is paralysis—that the muscles have lost something of their contractile power—the free division of tendons, and the application of a firm, unyielding shoe, does not seem likely to restore the muscular force or to strengthen the ankle-joint. Moreover, the foot is a complex organ, composed of several distinct portions, which are articulated together, and it is undesirable to act upon it as a whole, in the way that the mechanical appliances so often do; but it should be treated as consisting of at least two separate parts. Following out this train of reasoning, Mr. Barwell has asked whether tenotomy and the application of a mechanical shoe is necessary at all, even in the severer cases of club-foot. Does not such treatment add to the mischief? Does it not intensify the disease, which is essentially one of debility? This question the author answers in the affirmative; and then he proceeds to explain the method of treatment which he has devised, and which consists in supplying the place of the paralysed muscles by means of elastic cords. By a light and simple contrivance these cords are fastened to points as near the origin and insertion of the paralysed muscles as possible, and the patient is encouraged to use his limb, while at the same time constitutional remedies are prescribed, and local means, such as friction, galvanism, &c., are employed. Such is, in brief, the new method of cure for club-foot which Mr. Barwell has proposed, and which he has practised with apparent success during the last few years. Certainly it commends itself to us as a rational and physiological plan of treatment. It proceeds upon the principle, that our aim ought to be to strengthen weak parts, and not to weaken strong ones—a principle which is gaining ground every day in the practice of medicine and surgery.

But is this method of treatment applicable to all cases of club-foot? We can hardly suppose that it is. Even if the principle is found to hold good to the extent which its author anticipates, there will always, we imagine, remain a balance of cases which will require tenotomy and the use of a mechanical shoe. Congenital malformations, contractions following injuries, abscesses, &c.,—these cases will never be amenable to Mr. Barwell's plan; although after division of the tendons the use of elastic cords has been found of great service. We should have been glad if our author had discriminated more carefully the cases to which he considers his method is most applicable. This is a point of great importance in recommending a new plan of treatment. Nothing can be more damaging to an experiment than that it should be tried upon an unsuitable subject. We would therefore advise Mr. Barwell

to lay down clearly and distinctly the cases which he finds can be cured by his method, and to mention the classes of cases in which it is less applicable. At the present day, when the resources of our art are so numerous, the highest surgical skill consists in a wise discrimination of cases, and in the selection of the means of cure most suitable to the particular case in hand. Every one must have noticed how prone men are to fall into a routine of practice, and to deal with groups of disease rather than with individual cases.

In some of the severe cases with which he has dealt, Mr. Barwell has found it a good plan to begin the treatment by putting the patient under chloroform, and making rapid extension. By this means he has been enabled, after the lapse of a few days, to apply the elastic cords with greater advantage, and to expedite the cure. But we should be glad to learn whether our author finds himself able to deal with the severest class of paralytic cases by means of his method. Given an aggravated and long-standing case of club-foot from paralysis: are the elastic cords sufficient to effect a cure? None of the cases that are detailed in the volume before us give sufficient answer to this question; for they are either cases of children, or cases in which the disease had not long existed.

Following up his subject, Mr. Barwell has adapted his method to the treatment of knock-knees and crooked shins; and he has devised means by which spring force may be brought to bear upon these deformities in such a way as to draw the bones into a more natural position. An ingenious instrument for the cure of knock-knees is described and figured at page 210. It does not, however, appear to us to be so happily devised as our author's method of acting upon club-feet. It stands out so far from the leg that one would think a boy could hardly wear it at all; moreover, it is rather complicated, and must interfere with progression. Might not the same principle which has been applied to club-foot, namely, the principle of strengthening the weak side, be employed in treating knock-knees? Might not a broad india-rubber band be stretched down the inside of the leg, while the outside was, if necessary, supported by a light splint? Would not such a plan be more in harmony with the physiology and pathology of the case than the method here described?

When we were speaking of the unsatisfactory results which often seem to follow the division of tendons, we made an exception in favour of the *tendo-Achillis*. This tendon, by reason of its size and its isolated position, unites readily and with comparative certainty. There cannot, therefore, be the same objection to cutting it that there is to cutting the other tendons; and we believe it is in simple cases of *talipes equinus*, that the best results of tenotomy are seen. Speaking of this operation, Mr. Liston says in his "Practical Surgery,"—

"Twenty-five instances of division of the tendon have come under our care within the last six or eight months, and an almost uniform success has followed the practice pursued. In some a rapid cure was effected, and in all marked good effects followed. Even in the most unfavourable instances, when the deformity was both great and of long standing, the application of proper apparatus within a week or two after the operation, produced a more decided improvement in the form of the limb in two or three months than usually follows the adaptation of mechanical means alone in twice as many years."

It would appear, therefore, from this testimony among others, that the subcutaneous division of the *tendo-Achillis* is quite satisfactory. It is the practice of dividing the secondary tendons about the ankle-joint which is open to a question.—*British and Foreign Medico-Chirurgical Review, July*, 1866, *p.* 23.

34.—ON THE TREATMENT OF ENLARGED BURSA OVER THE PATELLA.

By William S. Savory, Esq., F. R. S., Assistant-Surgeon to St. Bartholomew's Hospital.

[There is as yet no single method of treating enlarged bursa over the patella which is recognised by surgeons as at once safe and sure. The milder plans

of treatment, by blisters, mercurial ointment, and iodine, are both slow and uncertain, whilst extirpation and the seton are liable to be followed by mischievous and even dangerous consequences. Mr. Savory does not think that the following method of treatment has received the attention it desires.]

The enlarged bursa is punctured with a lancet, or small knife, at its most prominent point; all its contents are carefully expressed, and then it is subjected to firm pressure by a pad of lint, strapping, and bandage, so that its walls may be everywhere kept in contact, and its cavity obliterated. This practice, according to my observation, is followed by one of two results. Either the bursa is obliterated outright, and there is an end of the case in a few days, or, in spite of the pressure, the bursa tends to refill. In this latter event, the fluid is again evacuated through the same puncture, and the bursa is again compressed. Then it may be cured, or may partially fill again, but perseverance in this plan soon succeeds. It must be observed, however, that when the evacuation is repeated, the character of the fluid which is discharged is gradually altered. It becomes more puriform. Therefore after two, or perhaps three, evacuations, particularly if there be any tenderness, a poultice is substituted for the pressure until the bursa subsides. But even in these last-mentioned cases, in which the plan is followed by the least simple result, a cure is, as a rule, accomplished more quickly and satisfactorily than by other means.

This simple plan of treatment may be adopted, I believe, in almost every case. It cures most quickly when the walls of the cyst are thin, and can be readily pressed together. It is most likely to require repetition, and to be followed by some suppuration, when the walls of the bursa are thicker and firmer. In some extreme cases, where the walls are very thick and the cavity a mere slit, the bursa appearing as a solid tumour, perhaps extirpation may be preferable, but I think this operation should be reserved for extreme cases. When the bursa is inflamed, a few days' previous rest is advisable. In the smaller bursæ the fluid has usually the characters of ordinary synovia; in the larger and thinner ones it is often more or less bloodstained from previous bruising, but this, according to my experience, does not at all interfere with the efficacy of the plan of treatment I am advocating. There can be no doubt, that, as a rule, the cure is more certain and rapid when the limb is not used while the pressure is kept up, but, in the great majority of cases, one need not insist upon quietude. Indeed, amongst the poorer classes, this plan of treatment has the great advantage, in many cases, of not depriving them of a single day's work.

The chief points to be attended to in the management of these cases are—

To secure, after the puncture, by gentle and careful manipulation, the complete evacuation of the contents of the bursa.

To take care that the subsequent pressure is equable and efficient, so that no cavity can remain.

To keep up the pressure long enough to prevent any chance of subsequent refilling. In every case the pressure should be continued for at least a week after the cure seems complete. It is safer, in some cases, to keep it up for a period twice or thrice as long as this. Indeed there is no excuse for discontinuing it too soon, for, if properly applied, it produces no inconvenience.

This plan of treatment is, of course, applicable to other bursæ, whether normal or adventitious, when enlarged and troublesome, provided it can be carried out. But in most cases there is little chance of being able to keep up firm pressure; there is nothing against which the bursa can be steadily compressed. But for the treatment of the ganglions which sometimes appear in the neighbourhood of the wrist, either in front, or on the back of the hand, this treatment seems preferable to any other. It is simple, safe, almost painless, and when thoroughly carried out, it rarely fails.—*St. Bartholomew's Hospital Reports, Vol. II. p.* 80.

35.—EFFICACY OF PERSULPHATE OF IRON AS AN HÆMOSTATIC.

By Dr. W. A. Wetherby, of New York.

[On March 3, 1866, Dr. Wetherby with Dr. S. T. E. Beck, of New York, were suddenly called to a gentleman upon whom the operation of excision of the tonsils had been performed a few hours before by one of the most skilful surgeons of the city.]

The blood was flowing at a very rapid rate; and, judging from appearances, the patient, who had already shown signs of syncope, had lost some forty or fifty ounces. We procured a drachm of Monsel's salt as soon as possible, and with a moistened probang covered with the powder touched the bleeding parts.

The effect was almost instantaneous; but lest there might be a recurrence of the difficulty, we dissolved the remainder in water, to be used as a gargle. The further management of the case was, as usual, very simple, and not a drop of blood flowed from the parts after the first application.

Case 2.—This case is more singular in many of its features, and may, perhaps, suggest a more extended use of this preparation than has heretofore been made.

During the night of April 25, 1865, I was called, perhaps more to fulfil the requirements of decency than from any confidence in the efficacy of my services, to visit Dr. L. N., of this city, who was suffering from an alarming attack of hæmotysis, which had failed to yield to the more usual remedies, as lead, opium, &c. It had been preceded for several weeks by a severe cough, profuse purulent expectoration, extreme emaciation, and, in fine, by all the symptoms incident to that slow but sure destroyer, consumption. The patient himself was aware of his condition, and had lost all hope of recovery, but begged me at least to make an effort to prolong his life for a few hours that he might dictate some last bequests to his friends abroad. Emboldened by my previous success with the article, and reflecting that all the usual legitimate preparations had failed, I sent for some *persulphate of iron*, very dry, and reduced to an impalpable powder. A small quantity of this was administered by *insufflation* into the lungs every hour during the remainder of the night and the following day. The success in arresting the hemorrhage was *perfect*, and encouraged by this, I was induced to experiment still further in correcting the discharge of matter from the lungs. Directing its use in the same manner, though with less frequency, for some time, and assisted by the action of general remedies, I soon had the satisfaction of seeing my patient leave his bed, his room, and in a short time his house; and now, in a few months afterwards, he is prosecuting a large and successful practice in his profession, subjecting himself to all its arduous duties with no inconvenience or ill health.—*American Journal of Medical Sciences, July*, 1866, *p*, 106.

ALIMENTARY CANAL.

36.—A SIMPLE METHOD OF RADICALLY CURING REDUCIBLE HERNIA.

By Dr. Julian J. Chisolm, Professor of Surgery in the Medical College of South Carolina, U. S. A.

A simple plan for radically curing hernia, which I suggested and put into successful practice in 1859, consists in sewing the columns of the inguinal ring together, subcutaneously, by silver wire, and leaving the wire permanently in the tissues, so as to act the part of a permanent internal clamp. This restores to a great extent the virgin condition of the external oblique tendon which gives strength and support to the lower portion of the abdomen. The only instrument necessary for the performance of this operation is

a stiff needle five inches in length, very slightly curved towards its point, near which is placed the eye. The other extremity of the needle is secured in a firm handle, which enables the surgeon to control its movements.

The various steps of the operation are as follows:—The patient having undergone the usual preparation of having the bowels emptied by some mild cathartic, is placed in the recumbent posture, and all hair is removed from the pubic region corresponding to the side upon which the operation is to be performed. The hernial contents having been returned into the peritoneal cavity, the index-finger of the left hand is placed over the centre of the fundus of the scrotum (palmar surface upwards), the needle lying upon and parallel with it, the eye of the needle corresponding with the pulp of the finger, which can guide it in the direction it should take to the point of transfixion. The finger, with the needle now capped by scrotal tissue, is passed into the inguinal canal until the inner face of the columns can be readily felt. The pulp of the finger having passed well behind the internal column, the handle of the needle is seized, and the point, directed by the finger, is made to transfix the conjoined tendon and internal column at some distance from its free border. When the point of the needle projects under the skin of the abdomen, an assistant draws the skin inward towards the median line, so as to make the needle perforate that portion of skin which would normally lie over the central portion of the canal. The needle is now threaded with a silver wire and then drawn back into the canal and through the scrotum, leaving one end of the wire exposed upon the abdomen. If the point of the needle has escaped from the scrotal puncture, it is carefully reinserted through the same orifice, and, directed as before upon the pulp of the finger, passes with the invaginated scrotum into the canal, and is made to transfix the external pillar of the ring. As the point lifts the skin the abdominal covering is drawn outwards in such a way that the point of the needle protrudes through the puncture first made in the skin of the abdomen. The silver wire is now detached from the eye, and the needle completely withdrawn through the scrotum, leaving the two ends of the silver wire protruding from the abdominal puncture. The portion of wire embedded in the tissues forms a long loop, which extends continuously through each column of the ring to the bottom of the scrotum; the extreme convexity of the loop lying in the scrotal fascia under the skin, where it can be felt by passing a probe into the scrotal puncture.

The next step of the operation consists in drawing firmly upon the ends of the wire, whilst the scrotum is drawn downwards and its invagination prevented, which forces the wire to tear or dissect up the scrotal fascia to the immediate vicinity of the ring. If the finger be now thrust up into the canal and the wire drawn upon, the finger will be squeezed by the approaching columns; and if drawn out of the canal, and the wire be still drawn upon, the ring will be so diminished in size, as only to accommodate the spermatic cord, with no room to readmit the finger. The wire is now twisted from above with a torsion forceps, and when the columns are brought well in apposition, without too much traction being made to cause the wire to act as an écraseur, the ends of the wire are cut off as close as possible to the abdomen, when the portion left in the wound immediately disappears from view, under the skin.

From the beginning to the end of the operation not a drop of blood is drawn, the only external evidence of an operation having been performed being a small prick in the skin of the abdomen and a similar one in the scrotum, either of which can scarcely be found, and which heal in a few hours. For a few days after the operation the patient is kept quiet, until the wire can become imbedded in lymphy effusion. No truss need afterwards be worn, as the wire clasping the columns of the ring restores the support of the abdominal wall; the truss, moreover, would act injuriously by painfully compressing the skin against the incarcerated wire suture. One suture suffices for the majority of herniæ. Should the orifice of protrusion be of large size, as in large inguinal or umbilical herniæ, two or more sutures may be required to keep the borders of the opening in perfect apposition. A point of much impor-

tance is that of introducing the needle the second time exactly through the same orifice in the scrotal skin as it had traversed in its first introduction; for should a portion of the skin be involved in the loop of the wire, the ready dissection of the scrotal fascia cannot be effected without much force, and the scrotum becomes invaginated in the inguinal canal. The same rule holds good for the abdominal puncture, otherwise the twisted wire will not slip under the skin and become embedded in the subcutaneous fascia.—*Lancet, Sept.* 1, 1866, *p.* 231.

37.—A CASE IN WHICH A NEW OPERATION FOR THE RADICAL CURE OF HERNIA WAS SUCCESSFULLY PERFORMED.

By Arthur E. Durham, Esq., Assistant-Surgeon to, and Lecturer on Anatomy, at Guy's Hospital.

[The patient was a sailor, twenty-six years of age, who was admitted into Guy's Hospital with an easily-reducible but very troublesome inguino-scrotal hernia. He could not wear a truss.]

On Jan. 19th, chloroform having been fully administered, and the hernia reduced as completely as possible, Mr. Durham proceeded to operate in the following manner:—An incision, about two inches and a half in length, was made through the skin and superficial fascia, in a direction at right angles to Poupart's ligament, and just over the inner border of the internal or deep abdominal ring. The tendon of the external abdominal oblique muscle was next divided in a similar direction, but to a somewhat less extent, and in a situation slightly further from the median line of the body. The lower fibres of the internal abdominal oblique or cremaster were then separated longitudinally, and the internal spermatic fascia or fascia propria of the hernia was exposed. A slight incision having been made in the lower and deeper part of this fascia, an aneurism needle was carefully insinuated through the areolar tissue, and by its means a ligature was placed between the sac of the hernia and the important structures of the spermatic cord, and carried through the upper and deeper part of the fascia. The fascia and sac were then drawn gently downwards and towards the median line of the body, and the ligature was tied tightly as high up and as far outwards as possible; in fact, as nearly as could be judged, exactly at the internal or deep ring. The ligature thus included the greater part of the circumference of the fascia propria or internal spermatic fascia just where it becomes continuous with the fascia transversalis, the whole circumference of the sac just at its junction with the general peritoneal lining of the abdominal parietes, and within the sac a small plug-like portion of omentum. In passing the aneurism needle, a small puncture was unintentionally made into the sac. This puncture, however, when subsequently dilated, afforded the opportunity of ascertaining that the sac did not communicate with the tunica vaginalis testis, but that it contained a small piece of irreducible omentum; this was drawn out and cut off below the ligature. Finally the wound was closed above and below by sutures, which were passed through the sac. The ends of the ligature were left coming out through the middle of the wound.

The after-progress of the case was most satisfactory. The patient was kept absolutely in the recumbent position for more than six weeks. From first to last he never had a single bad symptom worth mentioning. There was never any abdominal tenderness, constitutional disturbance, or other indication of general peritonitis; nor was there ever much pain about the site of the operation. The upper and lower parts of the wound healed by first intention. The ligature came away on the eighteenth day, and complete closure of the wound speedily followed. On the 29th March, the patient, having to a certain extent recovered his strength, went into the country. Before leaving the hospital he was examined by all the members of the surgical staff, as well as by many visitors. There could not be discovered the slightest hernial protrusion, nor any abnormal impulse on coughing. The inguinal canal from the internal ring seemed perfectly blocked by the obliterated sac and new material.

This case, although a solitary one, may be considered to prove—first, that the method of operation described is practicable; and secondly, that it is not necessarily attended by danger. The author would add that he believes it to be more scientific in principle than any other method yet adopted, and he hopes, therefore, it may prove more successful in practice.—*Lancet, June* 16, 1866, *p.* 662.

38.—ON FEMORAL HERNIA.

By Dr. MAURICE H. COLLIS, Surgeon to the Meath Hospital, and County Dublin Infirmary.

A very great and important change has taken place in the treatment of strangulated hernia within the last thirty years; at least, it is only within this period that the improvement to which I allude has become at all general. Formerly when a portion of intestine became strangulated much valuable time was lost before an operation was decided upon. Purgatives had to be administered by mouth and rectum, the lowering effects of bleeding, tartar emetic and tobacco, were, one or other, or all judged necessary, and prolonged attempts at reduction by taxis were repeated from time to time. Although by these means a small percentage of cases escaped operation, the remainder (a great majority) were placed under disadvantages which more than counterbalanced the benefit. In those days, according to statistics, which I have compiled from various authors, the percentage of deaths, at the lowest computation, exceeded fifty per cent., and some writers, who refer to the earlier times, assert it to have been as high as two deaths in three. This great mortality was due to the combined influence of delay, of depression resulting from medicines, and of actual injury done to the intestine by the taxis. We now operate early in cases of strangulated hernia. A fair trial is given to remedies, but if they do not act promptly we proceed to operate.

As to the mode of applying the taxis it cannot be too frequently repeated that the object of the taxis is not to return the intestine, but to empty it. Any one who studies the mechanism of hernia will at once perceive why this is so. When a knuckle of intestine comes down through a narrow opening, it gets spread out, filled with feculent matter, and gorged with blood, so that it quickly comes to bear no manner of proportion to the passage through which, if at all, it is to get back into the abdomen. If direct pressure is made upon it when in this condition, this may flatten it a little, but cannot assist in returning it. Nay more, it increases the obstacle to return, which is produced by the disproportion between the size of the ring and the protruding intestine. The taxis is to be properly performed by laying the fingers all round the tumour, and by trying to compress the tumour by a movement which shall tend to approximate the tips of all the fingers. By this concentric movement of the fingers the intestine is gently compressed so as to unload it, if possible, first of its gaseous contents and then of its feculent, and perhaps also to diminish the amount of blood which circulates sluggishly and in a congested stream through the vessels of its walls. That this is so, all surgeons who have succeeded in returning a hernia know; first is felt and heard the gurgling passage of air from the intestine back into the abdomen, then by continued pressure the fæces follow, and finally, the intestine is felt to slip up. Let this be borne in mind whenever taxis is used, and more especially when the stricture has been divided external to the sac.

Although chloroform is more especially useful in inguinal hernia, where the ring is more or less connected with muscle, its use is not to be despised in femoral. No doubt it cannot relax the ring, but it has great power over the abdominal muscles, and even over the muscular coat of the intestine. You have all seen how rigid the abdomen becomes when the bowel has been constricted for even a few hours. This rigidity yields under chloroform. I therefore advise you to chloroform your patient even in case of femoral hernia. In inguinal hernia this alone will often effect its reduction; and you should use it as a preliminary treatment before speaking of operation to your patient. In femoral, however, I have rarely found it of such distinct service

until some at least of the constricting bands are divided; hence, I seek the patient's concurrence in the operation before I give chloroform, so that the one administration of the anæsthetic may suffice.

I now pass on to call your attention to Gay's operation. It is beautifully simple, and if you will take the pains to understand it you will find it as safe as it is simple. You all know where Gimbernat's ligament lies; its position is further marked out for you by the tumour, to the upper and inner side of which it lies. Feel, then, for the neck of the tumour, the spot where you cannot get your fingers under it, where it feels as if part and parcel of the deep tissues of the thigh, and on its inner side make an incision through the skin long enough to admit easily the forefinger of your left hand—from three-quarters of an inch to a full inch will do. The direction of this incision, as recommended by Mr. Gay, is nearly vertical, and such a line has been usually followed in all cases that I have ever seen or operated on. One objection to it arises at a later period of the progress of the case, and to this I shall now allude, although somewhat out of place. The skin in this locality abounds in lymphatic vessels, running from the pubic and infra-pubic regions to the superficial chain of glands in the groin. Any vertical or oblique incision necessarily divides many of these small and thickly-packed tubes; hence arises frequently inflammation of the glands, which may run on, as we have lately seen, into either suppurating bubo, or may be the centre of a diffused suppuration. To avoid these consecutive accidents I propose, for the future, to make the preliminary incision parallel in direction to Poupart's ligament.

In whatever direction this incision be made it is merely to go through the skin; the finger nail is now to be used to pick up on the side of the sac every constricting fibre which intervenes between the surface and Gimbernat's ligament. The number and direction of these bands will vary according to the length of time the hernia has existed. In recent hernia there will generally be found one tolerably well-marked superficial constriction, firm enough to be taken perhaps for Gimbernat's ligament. This is formed by that portion of the superficial fascia, known as the cribriform fascia, through which the saphena vein passes to the deep femoral, and through which also at this or some other opening the hernia often escapes. This is to be divided carefully with the hernia knife. The hernial sac may then be gently compressed to see if it will yield, or it may be slightly drawn down, if possible, by one finger in the wound.

It is quite possible that such a manœuvre may occasionally succeed. Care must be taken not to use too much force. In older hernia a succession of fibres and bands are found spread along the body or elongated neck of the sac. When all these are divided the true stricture is reached at Gimbernat's ligament; it lies wonderfully deep down, and it is to be remembered, the finger must be pushed on at right angles to the plane of the external wound, not being suffered to pass in any degree upwards, else the stricture will be missed, and the finger be lost in a region above and superficial to it. Once felt it cannot be mistaken; a touch of the knife divides it enough, it matters little whether upwards or inwards; a slight nick will do; gentle compression with one finger in the wound and the others outside upon the sac, will now empty the latter and complete the reduction. Cases will occur now and then in old herniæ where these measures are insufficient. The neck of the sac is thickened, the intestine is adherent, there is an hypertrophied mass of omentum, and you find even a free division of Gimbernat's ligament insufficient to get the hernia reduced. In such cases you should open the sac sufficiently to allow your finger in, and divide the constriction at the neck of the sac, if any exist. Large masses of omentum may be either broken up and returned, or in rare cases it may be needful to cut them away. The adherent intestine will be carefully separated from the sac and returned; in rare cases this is impossible, and you must be content to divide all constrictions freely (as is known by your being able to empty the gut), and to leave it *in situ*. As regards stricture by the neck of the sac, an old hand may even venture to nick the outside of the sac with great care, and so may

avoid the necessity of opening it, but I do not advise a beginner to try this delicate and dangerous manœuvre.

You may hear many objections raised to Gay's operation; they have been refuted over and over again. Some of them arise from prejudice, others really from ignorance. The former will yield as surgeons become impressed with the superior safety of the operation; of the latter I give you but one example. It has been said over and over again, that you run the risk of returning the hernia strangulated *en bloc*—that is that you are liable to send back the sac, with its contents in one mass, still strangulated by the constriction of the neck of the sac. This really silly objection ought not to pass the lips of any one who knows how to use the taxis aright. Such an accident I never saw, nor can I conceive it to occur in the hands of any one who knows how to use the taxis properly. Gentle concentric compression, and not direct backward pressure, as I said before, is the proper method, and if this is remembered the return of the hernia *en bloc* cannot occur.—*Medical Press and Circular, July* 18, 1866, *p.* 65.

39.—AN ENEMA TUBE.

By Dr. J. Y. Totherick, Sudbury, Derby.

[Dr. Totherick considers that the following apparatus combines cheapness, simplicity, and efficiency, in no ordinary degree.]

The apparatus consists simply of five or six feet of three-eighths inch india-rubber tubing, to one end of which is fixed an ordinary funnel capable of holding a sufficient quantity of liquid, and to the other end one of the common ivory insertion pipes. The method of using it is as follows:—1st, fill the funnel with the liquid to be employed, whilst holding the exit pipe at the same level; 2ndly, squeeze with the finger and thumb the end of the pipe to which the ivory is attached, to prevent premature exit of the fluid; 3rdly, insert the ivory exit pipe into the rectum; 4thly, elevate the funnel to the length of the tube, and allow hydrostatic pressure to force in the injection.—*Lancet, Oct.* 6, 1866, *p.* 401.

40.—ON ARSENIC IN HEMORRHOIDS.

By Dr. T. Parvin.

Last summer a friend suffering with "hay-asthma," called upon me for a prescription. He likewise was a martyr to hemorrhoids, and had been for years; in vain he had submitted to the ligature, to nitric acid, to incision and to excision—each of these relieved for a time, and then the trouble returned. Fowler's solution was prescribed for him, with reference solely to the asthma. At the expiration of a week, there was no improvement in the difficulty for which the arsenic was administered, but there was a remarkable change for the better in the hemorrhoids, and a further continuance of the remedy relieved him entirely. Since that time occasional relapses have occurred, but they yielded quite well in a few days to eight drops of Fowler's solution three times a day. It is now upwards of 30 years since Sir Charles Locock pointed out the value of arsenic in the treatment of *atonic menorrhagia*; and quite recently Dr. Handfield Jones ("Functional Nervous Disorders") explains the results by the influence arsenic exerts in producing contraction of the blood vessels. Doubtless this is the way too in which it acts upon the enlarged hemorrhoidal vessels, although its application in the treatment of such diseased state is to me entirely novel, and the discovery purely accidental. That it does good I do not doubt for a moment; but that it should be resorted to, neglecting the condition of the intestinal canal with reference to proper secretion and evacuation, would only tend to discredit by failure what I believe will be proved to be a valuable application of an important remedy.—*Cincinnati Journal of Medicine.—Medical Press and Circular, May* 30, 1866, *p.* 575.

41.—CASES OF URINARY AND ANAL FISTULÆ, CURED WITH AND WITHOUT OPERATION.

By Dr. Andrew Paul, A.B., London.

"Can cancer be cured without the knife?" was a question asked in the leading journal of this country, some twelve years ago, by a most amiable clergyman and accomplished divine, himself a sufferer. This gentleman had been a patient of the writer ere this, for inward piles, and had got well.

A thunder-storm of professional wrath assailed this would-be-doubter of scalpel supremacy. Yet *time*, since then, has modified very much professional opinion as to the almighty influence of the knife in the radical cure of the cancer.

Just so may it turn out now, on the question being asked, "Can anal and perinæal fistulæ be cured without the knife?" Professional echo will answer "No!" Here, then, reader, you have so many cases, as *naked facts*, from a dissentient voice.

Case 1.—In 1854, a young gentleman, in a government office, Whitehall, came under treatment, with five fistulous openings in right buttock, and two urinary openings midway between anus and back of the scrotum, the result of urethral stricture, caused, as he said, by strong injections.

A single-waxed string, conveyed by an eyed-probe, was passed along the main pipe of these sinuses, tied in a loose loop, and left there. The string—seton-fashion—continued *in* for three weeks. Surgeons in olden times found it very hard to keep a seton in nape of the neck, from ulcerating *out*, here the intention obviously is for the string to cut *out* the parts in the rear, healing as the thread advances, and curiously enough, its presence in the main tunnel, aided by water aspersion, percussion, and injection, into and against the surrounding parts—hot, when tender; cold when not so—not only obliterated the one wherein it was, but the four tributaries as well. The enlargement of the right buttock, which, from long-continued burrowing of matter, had become twice the size of its opposite neighbour, subsided. The urethral discharge, with which the patient was literally flooded, ceased by catheterism of water percussion, and aspersion along the floor of the urethra, the stricture gave way, and, in time, the urinary fistulæ also dried up. And cold water injections materially helped in altering the diseased structures around. What one of us who would not rinse out his mouth after teeth-cleaning? so, likewise, the bowel, for health and cleanliness.

Case 2.—A gentleman, aged 30, called in the autumn of 1855, with urgent symptoms of retention, consequent upon stricture, in a state of spasm, the result of excessive drinking the previous night. Three years before had been treated by caustic injections for urethral discharge, that had stuck to him for six months. He begged to have an instrument passed, but was put off with the assurance of a more speedy and less painful method of immediate relief. He was seated over a shower of hot poppy-head water, from a douche-jet No. 1, for about twenty minutes, when, to his amazement, a stream of water flowed from him almost involuntarily. He was desired to continue this daily and nightly for a month. Has since indulged in after-dinner libations with impunity, relying upon aspersion alone to anticipate or to meet the urgency of an attack; and has latterly been using cold aspersion with an amount of benefit such as has insured to him release from an attack ever since. This case, bearing as it does upon the previous one, is given as a proof of local anæsthesia from warmth.

By adopting this simple course, at the same time applying cold per anum, as by lavement, not only will the impression of this salutary agent be conveyed through this channel—the rectum—to the bladder, but the bowels will be kept thereby in an easy comfortable state. Let any one afflicted with incontinence of urine from catarrh of the bladder, from prostatic disease, or from uric acid, or alkaline in excess—above all, from chordee—inject, were it but a wineglassful of *cold* water, into the bowel, he will be astonished by the effects,

from the instantaneous relief experienced through the agency of this powerful sedative.

Case 3.—A gentleman in the City Bank, April, 1856, has had gonorrhœa thrice. The last time treated with stimulating injections. A fortnight after getting well, felt uneasiness and pain in the perineum. An abscess formed and was opened by a surgeon, but the urethra was not then explored. The abscess healed up and cicatrized. It opened again the following January, and notwithstanding caustic in substance and astringent lotions, the outlet had not closed up at the time of his call. He said he wished to get well soon, as he was to be married at midsummer. Catheters Nos. 5 and 3 failed. Having used hot water aspersion for twenty minutes, No. 10 catheter passed into the bladder with the greatest ease. On his subsequent visits, the catheter invariably passed, as at first aided only by the hot water jet. The next step was to close the fistula, and to cure the gleet, which off and on stuck to him from the first. He was enjoined to use aspersion, if possible *before*, passing water. On two occasions a probe, with a hole and string through its probe-end, and dipped in a weak solution of sulphate of zinc, was passed down the fistula as far as it woul dgo. The result was that, instead of his shirt being wetted the size of one's hand, the urine stained a surface not larger, at first, than a crown; nor, secondly, than a sixpence; ultimately he passed water without one drop escaping through the opening.

Case 4.—May, 1864, Mr. W., from Brighton, called. Fistula in left perinæal region, leading towards the anus. Passed an armed probe, which, on reaching the lining membrane, was made to pass through into the gut, and then hooked out, the probe being unthreaded, was withdrawn, and the string tied loose. Fomentations relieved the stiffness that ensued for a few days. Mr. W. was enabled to attend business, and occasionally to come to town. Refusing to have the string tightened, or changed for a new one, the time taken to work out extended over six weeks. Sea-water injections were used daily. The case ended in a cure.

Mr. W. had been cut for fistula on the right side, by the late Mr. Lawrence, and had been three weeks in bed.

This case could be traced to no other cause save to regular autumnal diarrhœa, which for years he had been subject to.

Case 5.—Mr. C., aged 52, called in August, 1856; a builder by trade. He never knew what illness was that needed a dose of medicine, therefore averse to taking any.

A solid tumour the size of a marble was felt in the right buttock, with a "core" leading towards the gut, full an inch and a half from the outlet; this was tender to the touch, no evidence at this time of matter having burst into the gut, as there was no pain at or after the closet, nor was there on the stool the slightest vestige of matter. Anal injections—warm when tender; cold after escape of matter—were the only means used during nine months; healthy action being set up, abscesses ceased to form, the opening closed, and all induration became absorbed.

This gentleman, who was seen twelve months ago, reports nothing amiss now.

Case 6.—In 1864, Mr. ——, mayor of a borough town in one of the midland counties, applied for advice. Fistula underneath the fold of left buttock, leading towards the gut, which it did not penetrate. An abscess had formed nine months before, outlet closing and opening as matter formed and ceased to form in surrounding tissues. In the centre of the right buttock was a second opening, leading straightforward to a depth of three inches into the buttock cushion, but unlike the other, not leading towards the gut. His health had been impaired. Scarlatina had entered his family six months ago; had been both mild and malignant in its form. My patient had it in the throat severely; since then, health indifferent; mind depressed; was advised to have both fistulæ laid open; objecting to this he commenced cold water aspersion, and injection; in the latter the *stream* of water against the anus so relaxed the strictures as to pass in unaided by elbow-pipe, thus creating desire for

stool, and to rinse out the rectum as well; this course has been pursued ever since.

For the last six months I have not seen this gentleman, though I have heard of him through the member for his borough, whose wife I have since attended for inward piles.

Case 7.—Mr. M., aged 30; strongly marked scrofulous diathesis; scars in various places, neck and chest; fistula lachrymalis of left eyelid years ago left a prominent scar; three openings in left buttock, two in right; not one leading into the gut; complained of palpitations, headache, sleepless nights, loss of appetite, occasional night-sweats; all tonics making as he said, his head worse; nothing in the way of medicine was taken. His office-hours were light, not over-confined to the desk; still he had to breathe in an atmosphere which he found prejudicial to health—namely, that of a wholesale tobacconist. The seton healed up four of these sinuses, still fresh collections of matter formed; as a last resource, I said, "to Margate forthwith; live well, and as much on the water and in the sea-air as you can; bathe also." He did so, in three months returning, with all the sinuses dried up; health and strength restored; since 1864 has been two voyages to America and back, as purser in a steamship company, wherein the writer procured for him a berth.

Case 8.—In August, 1865, Gunner R. Jury, Royal Artillery, Maidstone, came under treatment. A twelve-month before had been in hospital, and in bed at Woolwich six weeks, having been cut three times in the right buttock for complete anal fistulæ. The string took longer than usual to work out. Why? Because of the parts being indurated through the previous operations. On the left side there was an incomplete fistula running to, as on the other side towards, the rectum. The latter I treated with seton in the presence of Assistant-Surgeon Boulton, to whose kindness and professional courtesy I feel much indebted. This case has got well, under Surgeon B., to whom luckily, at the time, a similar case presented, and who introduced a string, with similar results.

Case 9.—Quartermaster Sergeant G. Ripley, at the same station, and in the same troop as foregoing, applied to me for fistula on right side, and inward piles on the left verge of the anus. I passed a seton for the sergeant; duty in the saddle called him on parade next morning, stiff though he was, yet he went through an hour's drill. Was excused from similar duty but one morning all through the treatment. His *faith* in cold water aspersion and percussion was such that he never omitted to use it both before and after saddle exercise; this has likewise been successful. The inward piles now trouble him but little. The cure of fistula will often cure piles. These cases have been reported on to "headquarters," by the senior surgeon of the depot, as evidences of treatment quite compatible both with the ordinary duties of the soldier, who is not necessitated to forego them, and as not requiring confinement to the wards of a military hospital. The attention of the military authorities has also been directed to the treatment, as the means of saving to this arm of the service many valuable men, who otherwise would be discharged.

Treatment.—1st, let us consider the *principle* on which it rests; 2nd, the *process* by which it is accomplished.

The structures in and around the anus are, even in the normal state, but of low vitality, and when diseased, are most prone to suppurative inflammation. It is extraordinary the extent of mischief entailed on this locality by neglect or by untimed treatment. Three such cases could be adduced were it necessary; one, however, is given briefly as a striking instance how mind and body become victimised. In 1838 a gentleman called from Yorkshire; repeated abscesses had formed; tardy ill-timed openings had been made; suppuration and sloughing from time to time had so destroyed the tissues surrounding the anus that a cricket-ball could be buried in the *gulf* between the tuberosities of the ischia; the anal sphincter had been destroyed, and though all was healed over, yet on the slightest error of the stomach or bowels, wind, gelatinous exudation, and liquid fæces, would escape. His object in calling was to procure some mechanical means of resisting fæculent escape. Though a

family man, with ample means, yet so sensitive was he on the score of effluvia, as to live in a separate wing of his mansion, apart from his family, still so personally, so scrupulously clean, that the most *fastidious nose* could detect no smell. A spring-bandage and lint pad, with aspersion and injection, so far obviated the nuisance complained of, that this patient, on calling a twelvemonth after, assured me everything had succeeded. The pillars of the rectum had assumed the office of sphincters, and that, excepting when relaxed, he gained complete control over the exudation and had returned to family society. Before we met he declared he was barely passing through life, "now (on his second visit) I'm enjoying it." But to return, a new and *long-continued* action must be set up. Those who fancy the knife must admit that in twenty-four hours after the operation all irritation sinks below par, requiring caustic in substance, daily and nightly dressing, relays of poultices—in hot weather most offensive—strong astringents, chloride of zinc, Condy's fluid, all combined, caging the patient for weeks—nay, months—within the walls of bed or dressing-room; whereas with string or seton, long-continued healthy action, aided by the other means, is kept up, and this at the cost of but trifling inconvenience to the patient in the pursuits of every-day life. Such is the experience of thirty years. Nor can it be said with truth that the string is much in the way during the calls of nature. Even the act of cleansing is productive of good, as the seton is moved and drawn upon, so as to allow the escape of matter should the string cause lodgment. Once the wall of the gut becomes perfect by healthy granulation, no further escape of gas, of fæces, or of the bowel's exhalation can escape into the structures around; hence a stop to suppurative inflammation. In short, after the string has *cleared* the bowel, and the slit has been filled up by granulation, the *bore* of the gut again becoming *patent*, neither gas, nor fæces, nor exudations, can escape therefrom. The seton enters upon its second stage—namely, to rectify and to restore to health the structures *outside* the wall of the gut, which to a certainty it will do the looser it is, the longer, therefore, will it remain in the flesh. If tightened every other day, the seton will work out in ten days, quite too short a time for the object in view—viz., restoration to healthy from *un*healthy structural action, the surgeon will be beat and his patient annoyed. For what happens? The superficial parts bridge over by too hasty adhesion, the tunnel underneath remains, the surgeon has to break up the adhesions on the surface, some stimulating ointment must be applied, a torpid state of parts set in, just as after the knife performance, and time is lost. The writer has often noticed that some patients' flesh will *rot* the string much sooner than others. So was it in the gunner's case. The seton had to be replaced thrice; whereas, but lately, in the case of Capt. S. (fistula having followed dysentery in India), the second string, when withdrawn, was found as tough as a trout-line, which the captain, another Isaac Walton, assured me would hold a good-sized fish. In the case of Mr. W., Brighton, the seton was not once changed.

2ndly. The "process," or method of getting the seton in. In all these cases of fistula, whether anal or urinary, there is invariably undue crampy-action of sphincters, or of the urethral muscles; hence extreme tenderness, often amounting to torture, whether from the finger introduced, or from catheter ever so gently passed, the hot water aspersion, or as recently, the "ether spray," for five or ten minutes, will allay all spasm; a simple silver probe or fine gum-elastic catheter, tipped with a silver bulb, having an eye drilled in the probe end, is passed along the fistula. On its reaching the gut there, the forefinger of either hand passed into the bowel will encounter the instrument and will hook it out. The eye of the probe is then threaded with an ordinary shoemaker's "waxed end," to which a bristle has been secured. This bristle helps the surgeon vastly to thread his probe, the waxed end is drawn through the probe eye, so as to double the string or not, as the surgeon thinks fit; the probe is withdrawn, first, back into the gut; secondly, out from the fistula. The probe is cut off, and the surgeon ties his loop, tight or slack, with an ordinary reef-knot, cutting off the ends of the waxed string, so as to be out of the way in cleansing.

If the surgeon wants to change his string, all he has to do is to loop on

over the knot a second waxed end, the knot will keep the new string from slipping. With a dissecting forceps he draws the circle of the original loop round and round until the knot, holding on the loop of the new string, clears either the fistulous or the anal outlet, he then cuts the old string, and with the new one makes a new loop. Should the surgeon be summoned to a case without knowing beforehand what is the matter, if he has not got his probe in his pocket, rather than probe a fistula twice, let him ask for a lady's bodkin, which, if silver, supple, and with an eye in the bulb, will answer just as well as a Weiss's or Fergusson's probe, three or four strings of whity-brown thread, well-waxed, will answer his purpose: thus the surgeon kills two birds with one stone. he probes his fistula, and, at the same time, he passes his string to cure it. If the anal fistula be incomplete—*i.e.*, not entering the gut—the moment his finger in ano meets with the head of the probe, he can scratch with his nail an opening for the probe to pass in, making the probe a fulcrum for the finger nail to act on.

Remarks.—Incontinence of fæces—a rinderpest plague-spot to the knife, has not followed in one single instance upon the foregoing method.

That fissure, fistula, both anal and urinary, can be cured without the knife, has been, as it is to the present hour, amongst bygone and modern surgeons, a *vexata questio*. To this, historical surgery, both periodical and voluminous, amply testifies. The "perineal section" has been a *casus belli* amongst moderns, north, south, east, and west in the British Isles.

Indeed, one doubts whether an individual advocating or venturing to advocate, a peaceful mode of treatment is, or is not, an orthodox member of the "war conference." However the writer trusts that ere the "treaty" be signed the working of his principle will have a further and fairer trial. As in military so in surgical warfare, routine must eventually give way to mishaps. Years may pass ere such be the result. In meantime we must be content to escape, if we can, the casualties which "system" entails upon us. Should we, like Shadrach and Co. of old, escape scatheless from the fiery furnace, *fortune* indeed has smiled upon us.—*Medical Press and Circular, Aug.* 1, 1866, *p.* 117.

42.—ON A CASE OF DOUBLE PSOAS ABSCESS, WITH WOUND OF THE FEMORAL ARTERY.

By JOHN ADAMS, Esq., Surgeon to the London Hospital.

[Mr. Adams relates two cases, in the first of which the opening of the abscess was followed by death in forty-eight hours, in the second a cure resulted, thanks to wine, quinine, good diet, and rest in the semiflexed position for many months.]

I think I am right in the conclusion to which I have arrived from the observation of many cases that, where the abscess depends on disease of the bodies of the dorsal vertebræ, the cause is more likely to happen than if the lumbar vertebræ are affected. I presume that in the dorsal region there is a more natural tendency to coalition of the bones from the direction of the natural curvature than in the lumbar region, where the bodies of the vertebræ present a natural convexity forwards. In the last case I do not hesitate to say that the disease was in a very great measure cured by position of parts; but of course a great deal depended on the stimulus and good diet this young woman enjoyed in the hospital. In the case before us the disease has been of very long standing, and the vertebræ have become fixed, and the abscess is probably consequent upon some access of inflammation in the body of one or more of the dorsal vertebræ, as indicated by pain at the seat of curvature and general indisposition. You will have observed that both abscesses had remained stationary for a very long time, and that all my efforts were directed to the improvement of the boy's general condition, for this purpose sea-air was recommended, and he was expecting daily to be sent to Margate. However, on my visit on June 2nd, I found that the abscess on the right side had suddenly enlarged, and the enlargement was attended with great pain and tension. I therefore proceeded to open it, taking, as I pre-

sumed, the greatest possible precaution to avoid the femoral artery, which is so often displaced in deep abscesses. Unfortunately, however, I not only punctured the artery, but I actually slit it up for the distance of a quarter of an inch. I need not say that the escape of arterial blood in a rush, and with an audible whiz, informed me of the fact, and I at once enlarged the opening in the abscess on my forefinger, seized the structures between my finger and thumb of the left hand, and asked my colleague, Mr. Maunder, who was present, to secure the artery with an armed aneurism needle. This was done with great facility after he had laid bare the artery on my forefinger. When the ligature had been applied above the wound I sought for the opening in the artery and directed another ligature to be applied below the opening. I felt now that everything was secure, the limb was enveloped in cotton wool, and treated as after ligature of the superficial femoral for popliteal aneurism.

Let us now pause and briefly consider this case. Where was the abscess which had thus dislodged the femoral artery and raised it from its bed? Clearly it had made its way in the course of the psoas, but instead of pointing superficially, as it does most commonly, it had taken a direction deeper than usual, and most likely had made its way, as the muscles does, downwards towards the trochanter minor and along the front of the femur under the fascia lata. Anatomy teaches us all this with great precision, and believing in the possibility of such an occurrence, I had actually made the remark that before opening deep abscesses like the present, the surgeon should satisfy himself as to the position of the femoral artery. I did with my own fingers try to feel the artery, but I failed to do so. Its pulsation was no doubt feeble, and most probably the tension of the abscess from below rendered it quite imperceptible. I cannot say I erred from ignorance; but I am free to confess that I should have been more cautious. But having opened a large artery you must proceed to tie it, for no pressure, however judiciously applied, is sufficient to prevent a recurrence of hemorrhage usually; and although exceptional cases may now and then occur, believe me there is no security against bleeding equal to the ligature when a large artery is wounded. In this case no pressure could be applied, as there was no solid body in the vicinity of the artery,

What is the treatment to be pursued in psoas abscess? Put this question to yourselves and think the case over. The disease here evidently is in the spine, the abscess is its consequences; therefore, put aside the question of the abscess and try and cure the disease on which it depends. If you can do this, the abscess may disappear, either by becoming absorbed, or you may open it. That abscesses do disappear I have no doubt. The case illustrates the position, for during the treatment of the abscess in the right thigh that in the left has altogether disappeared. I remember a case, under the care of Mr. John Scott, formerly a surgeon of this hospital, in which a psoas abscess suddenly disappeared, and the urine was loaded with pus for some days; clearly the abscess burst into the bladder or the ureter. The patient got well. It is, however, advised to let the abscess alone as long as you can, either hoping for its disappearance or deferring the opening until absolute necessity demands your interference by operation. No man likes to meddle with such cases unnecessarily.

The proper time for opening the abscess is when tension and its consequent pain render the case unbearable. How, then, are you to open psoas abscess? This question implies that there is some risk in the operation, and this really is the case. The risk is lest the patient should become exhausted by long-continued discharge, and that hectic fever should arise from inflammation of the cyst of the abscess consequent on the admission of air. Hence the efforts of surgeons have been directed to provide against this most frequent contingency. Mr. Abernethy advises that a small valvular opening should be made, the matter to be allowed to escape without pressure and by the elasticity of the sac itself, and the wound to be carefully closed by adhesive plaster; and after a short time, before the sac had refilled to its original size, that the puncture should be repeated, and a simi-

lar treatment again pursued as after the first puncture; and he hoped that by these means the cyst might contract, and the abscess might thus disappear. The plan rarely answers, and the reason is obvious—the disease of the spine still remains, and unless that gets well, which is most rare, the discharge must continue, and will, probably, eventually wear the patient out.

My advice is this—When you think it desirable to make an opening for the discharge of the matter, make one of moderate extent with a sharp-pointed bistoury, place a fomenting cloth over the opening, permit all the pus to drain away without pressing and by the elasticity of the sac itself, and after this apply a soft linseed poultice over the wound. You may use a drainage tube if you like, but the objection I have to its employment arises from its acting as an irritant in many cases, and thus increasing the discharge it was employed to diminish. Never lose sight of the general treatment of the case, by position, tonics, stimulants, and especially by sea-air, or, if this cannot be obtained, residence in the country. Machines for the conveyance of patients by rail are so beautifully contrived that no damage need result to the spine itself in travelling; or passive exercise, so to speak, may be enjoyed with the greatest ease, in the recumbent posture on the sea beach without the slightest fatigue.

But in these cases which result so unfortunately, remember the golden rule, *Principiis obsta.* Arrest the disease when it is just beginning. Remember that long before any advance has been made symptoms will have presented themselves which ought not to have been passed over, as pains in the loins, weariness in walking, emaciation, slight febrile symptoms, dyspepsia, constriction around the chest and abdomen in the course of the spinal nerves, and others of this character, which are the certain harbingers of mischief beginning in the vertebral column, which eventuates in that most intractable affection we are now considering. This is the period for the employment of issues, rest, tonics, &c., &c., and, at this time, if steady use of these means is enjoined you may fairly expect to ward the disease off altogether.—*Medical Press and Circular, Aug.* 1, 1866, *p.* 113.

ORGANS OF URINE AND GENERATION.

43.—ON THE ENDOSCOPE AS A MEANS FOR THE DIAGNOSIS AND TREATMENT OF URETHRAL DISEASES.

By Christopher Heath, Esq., Assistant-Surgeon to, and Lecturer on, Anatomy at Westminster Hospital.

For the benefit of those who may not have seen the endoscope, I may explain its nature in a few words. It consists of a paraffin lamp enclosed, for convenience, in a wooden case, from which the light is conducted through a lens on to a perforated mirror set at an angle in a cylinder. An eye-piece is adapted to one end of this cylinder, and to the other a screw, by which the various tubes which are to be introduced into the several outlets of the body may be attached. I have three tubes for the urethra, corresponding to Nos. 12, 10, and 8 of the catheter gauge, and which for convenience I call Nos. 1, 2 and 3, each measuring eight inches in length, and, being provided with an aperture on one side near the outer end, through which a wire, carrying cotton-wool, can be introduced into the interior of the tube, and be made to reach its extremity so as to wipe away any discharge from the surface under examination, or to apply medications to it. A larger tube, of similar make, is very efficient for examining the rectum; and a tube with a piece of glass at the end, can be used for examining the interior of the bladder, the glass preventing the entrance of water into the tube. The light, which is very powerful, and quite under control, is directed by the oblique mirror to the end of whatever tube may be employed, and the eye of the surgeon is able to look through the centre of the pencil of light without being dazzled, and to observe whatever may be brought into the field at its extremity.

I have been able to use the endoscope satisfactorily on the urethra, bladder, and rectum, but shall confine this paper to my observations on the urethra, and particularly with relation to the treatment of gleety discharges. In using the instrument for the examination of the urethra, the most satisfactory position for the patient is the recumbent one, on a table or sofa of good height, with the knees bent over the edge and slightly separated. The surgeon then introduces the largest tube which the meatus will admit, and passes it gently until he meets with an obstruction, or finds from the direction of the instrument that he has entered the membranous urethra, when it is well to pause lest on withdrawing the plug (which much facilitates the introduction, as with vaginal speculum) a gush of urine should take place. The tube is now attached to the cylinder of the endoscope, which is placed horizontally, and the light being adjusted, the operator proceeds to look through, when he will see the surface of the urethra at the end of the tube, shutting down upon it with perfect regularity if healthy, and by slowly withdrawing the instrument, with his eye still fixed at the cylinder, he will be able to note the various modifications which the urethra may have undergone in its whole length, if necessary afterwards examining the prostatic portion.

Although practice on the dead body is useful at first for studying the manipulations, it is necessary to observe the living urethra to gain a knowledge of the appearance of the mucous membrane in health; for, as both Desormeaux and Cruise have pointed out, the pallid appearance of the anterior part and the dark purple of the bulbous portion of the urethra, as seen in the dissecting-room, are due to post-mortem change, the healthy urethra in life being of a bright pink throughout, and only very slightly deeper in colour about the bulb. For the sake of contrast, although it is impossible to convey the full idea without colour, I have given a sketch of a healthy urethra as seen with the endoscope, and it may help the appreciation of it if I say that it resembles very closely, on a smaller scale, a healthy rectum as seen through a speculum, or a vagina, but with the difference that the folds of mucous membrane of the healthy urethra are longitudinal instead of transverse. I have noticed in perfectly healthy urethras that there is a constant vermicular contraction of the wall of the canal, apparently passing towards the bladder; and this accounts for the well known fact that foreign bodies in the urethra tend to pass in that direction. This is due, of course, to the muscular fibres of the urethra, and is wanting in cases where any induration exists. The mode in which an indurated and strictured (even though very slightly so) portion of the urethra closes down abruptly on the end of the tube as it is withdrawn is very characteristic, and contrasts strongly with the gradual closure of the healthy canal.

Great gentleness is necessary in introducing the urethral tube to avoid the induction of hemorrhage; and, indeed, it is hardly possible, in diseased urethras, to avoid a few drops of blood, which obscure the view at first, but can be readily removed by the careful introduction of a pledget of cotton-wool by means of one of the wires I have previously mentioned. Where hemorrhage has exceeded a few drops, so as to form a coagulum in the tube, it is, I find, better to withdraw the tube and cleanse it, than to attempt to sponge it out with cotton wool *in situ*, since the clot is very difficult to extract satisfactorily, and is apt to be pushed on into the urethra. The cotton-wool, if not carefully twisted on to the wire, may become detached and be left in the tube, or beyond it in the urethra. It may be fished out with a hook supplied for the purpose, but even if left in the urethra it does no harm beyond stopping the inspection for the time, since it is always passed on the first occasion of making water.

The application of a solution of nitrate of silver to its actual seat is one of the most useful methods of treating the disease revealed by the endoscope, and it is readily accomplished by one of the cotton-wool sponges I have described. The solution I have invariably used is that recommended by Desormeaux—namely, twenty grains of the salt to a drachm of water (1 to 3). This, although so much stronger than any of the ordinary urethral injections, excites no disturbance when applied to the diseased surface, and ordinarily

gives nothing more than a momentary smarting pain. I have never seen any inconvenience arise from its use, although, as might be expected, it sometimes increases the discharge for a day or two. The use of injections, and of internal remedies, must be had recourse to as well, however, in order to effect a cure, in the majority of cases.—*Lancet, Oct.* 13, 1866, *p.* 408.

44.—ON A NEW INSTRUMENT FOR THE CURE OF STRICTURE OF THE URETHRA.

By Dr. Charles Owen Aspray, Newton-road, Westbourne-grove, London.

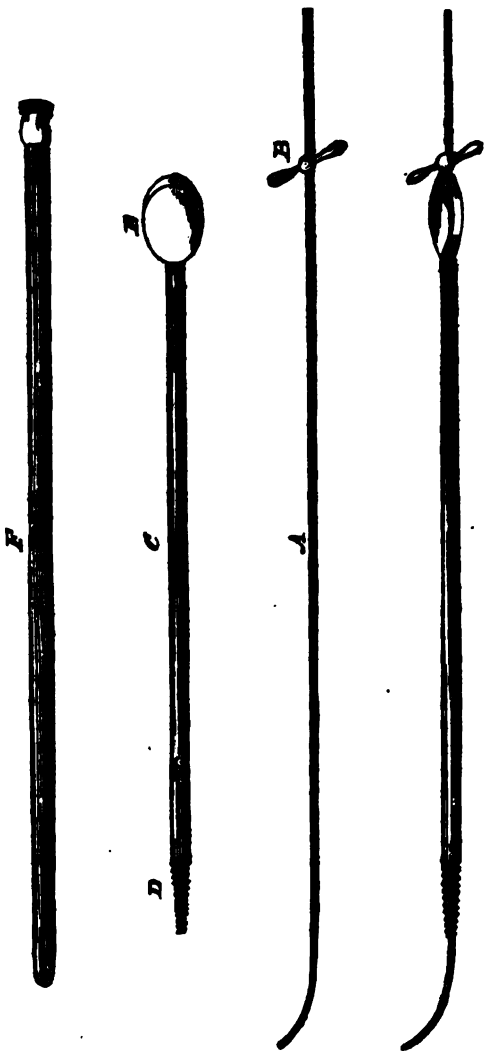
As regards safety in the cure of stricture of the urethra, the old system of gradual dilatation stands first; in fact, with it there is no danger if proper care be taken; it is, however, a tedious process, taking weeks, months, or it may be, years. The want felt of a quicker and perhaps more curative method has brought into being many dilators, most of which, although they act at once and with some precision, are yet attended with a considerable amount of danger and uncertainty in their use. Some of these instruments have great power, but simply burst open the stricture, the rupture generally occurring on the side which is most healthy, the fibrous tissue of the stricture being stronger than the healthy structures. Others are of no use, simply from a want of power.

The instrument which I wish to bring under the notice of the profession will, I think, combine the safety of the gradual method with the quickness of action and speedy cure of the rapid dilatation principle. I believe also it has some great advantages over instruments used of late for this purpose—viz.: 1st. As soon as No. 1 is passed, dilatation can be commenced without withdrawing the instrument, which is often replaced with great difficulty. 2nd. The extent of the dilatation at one sitting is left to the discretion of the operator, and a bougie, the size of the dilator used, can be passed into the bladder without withdrawing the first instrument, which may then be removed. 3rd. The power is sufficient to dilate any stricture, and can be used without the abrasion produced by the sliding tubes advised by many operators.

The instrument, kindly manufactured for me by Messrs. Mayer & Co., of Great Portland-street, from my own model and drawings, is composed of a No. 1 catheter (A), having a little cross bar (B), which serves as the handle, and can be removed when a screw is loosened. When this handle is withdrawn, the dilator (C), having the conical screw (D) at the end, can be passed over the catheter, and worked by the handle (E). The dilator may be the size of Nos. 6, 10, or 12, and has a thin metallic cover reaching from the handle (E) to the screw (D), working smoothly over the tube beneath. This is for the purpose of steadying the penis while the screw works in the stricture; it also prevents any abrasion about the anterior portion of the urethra. The bougie (F) is passed over the catheter into the bladder after the dilator is withdrawn, and will be especially applicable where a small dilator has been used; it may be left in from twelve to forty-eight hours, according to the wish of the operator. It will be seen from the above description that the principal novelty in the instrument is the use of the conical screw for the purpose of dilatation.

The catheter No. 1 is first passed into the bladder (which of course should be made certain by the urine passing through it); the handle being removed, the screw of the dilator is freely oiled and passed down the urethra until the obstruction is felt, when the penis should be firmly grasped by the hand, and pulled down over the dilator while it is screwed through the stricture. The operator must be careful during this part of the proceeding, not to push the guiding catheter with the hand; and next to unscrew the dilator when withdrawing it. If this be attended to, the operation is done without pain; but, if the instrument is pulled without any rotary motion, it will require some force to disengage it, and be painful to the patient. The dilator being withdrawn, the bougie is pushed into the bladder over the No. 1 catheter, which is taken out, and the bougie allowed to remain. I have found a bougie one

or two sizes smaller than the dilator to be of equal benefit with one of the same size; it is less trouble to pass, and produces no pain or abrasion. The bougie is of great service where there is likely to be much congestion after the dilation, and also in cases of urinary fistula, in which the instrument, I



think, will be especially useful in affording a rapid and certain means of permanent cure. As far as my experience yet goes, I think that in the majority of cases, perhaps in nearly all, the bougie is not required. Some little congestion is present for about twenty-four hours after the dilatation; and I find it better, if the bougie is not used, to avoid the trial of a catheter for some days (*i. e.*, some little time after the congestion has entirely subsided), when it is often the case that one a size or two larger than the dilator used will pass with ease Thus in Case 1 it will be seen that, although some difficulty was experienced with a small catheter two days after the operation, yet a No. 8

passed easily on the sixth day, the size of the dilator used being only No. 6. I believe the instrument, if properly used, produces just enough congestion and absorption to cure the stricture without any danger. I add the outlines of three cases.

Case 1.—J. C——, aged sixty-three, labourer. He has suffered from stricture of the urethra twenty-six years. The patient was operated upon at St. George's Hospital eleven years ago; after that he passed his urine in a large stream for some time. He has had treatment occasionally since. From his own neglect he now passes water only by drops, and very frequently in the day time; he also gets up many times in the night for the same purpose.

Dec. 17. Cannot pass any instrument.

18th. Succeeded in passing a No. 1 guide; used dilator No. 6. The stricture is situated at the bulbous portion of the urethra, and is of considerable breadth. The bougie not used; but the instrument withdrawn directly. Ordered tincture of opium, twenty minims; chloric ether, fifteen minims; camphor mixture, an ounce and a half: to be taken at bedtime.

19th. Has been out of bed many times in the night, and passed water with difficulty.

20th. Passed a No. 5 catheter down the urethra; but, finding considerable obstruction, withdrew it immediately. After this he voided his urine in a stream, which gradually increased in size; but I made no attempt to pass an instrument until Dec. 24th, when No. 8 passed into the bladder without the slightest difficulty. Thus in one week the stricture was cured without any bad symptoms.

Case 2.—J. A——, a gentleman aged twenty-eight. Has had gonorrhœa formerly, only once, but frequently had a gleety discharge since. He has noticed that his stream of urine has been twisted, and smaller than natural for four or five years; it is now very minute, and he has had occasional of chronic abscess. It promotes appetite, aud gives vigour to the syttem attacks of retention during the last twelve months. He also complains of scalding during micturition, and some discharge. The urine is very acid, and deposits a large amount of urate of ammonia. He is obliged to pass urine eight or ten times in the day. Ordered, twenty-grain doses of the bicarbonate of potash three times a day for a week.

April 20th. He does not micturate so often. Has less discharge and scalding. Passed a guide, used a No. 6 dilator, and left in a No 5 bougie. Ordered twenty minims of the sedative solution of opium immediately.

21st. Has felt little inconvenience from the bougie, which I withdrew.

22nd. Passes urine in a larger stream than he has done for years.

25th. Passed a No. 7 catheter.

The catheterism was repeated every three or four days, a larger instrument being used each time until May 5th, when I passed No. 10, and have used that sized instrument at increasing intervals ever since. He is now in perfect health, and is never troubled with any symptoms of stricture.

Case 3.—(A very small stricture complicated with chronic cystitis.) W. P——, aged thirty-two, blacksmith. Says he has had difficulty in passing his urine for the last five years. The urine now dribbles from him constantly, and is loaded with pus. I failed on three occasions to pass an instrument.

May 3rd. I succeeded in passing a No. 1 catheter into the bladder, and used a No. 9 dilator. I left in a No. 7 bougie, and gave an anodyne draught.

4th. He has passed a restless night. Bougie withdrawn. Voids urine in a stream the size of No. 6.

9th. Health much improved. The patient says his stream has increased in size every day.

10th. Passed a No. 9 catheter. The urine contains little pus now.

13th. Passed No 10. Goes to his work.

June 17th. His urine is free from pus. He has increased considerably in weight, and has never any trouble with his urine. A No. 7 staff is passed once a fortnight.—*Lancet, Aug.* 11, 1866, *p.* 146.

5.—ON THE TREATMENT OF SEVERE STRICTURE OF THE URETHRA BY OVER-DISTENSION.

By Henry Thompson, Esq., Surgeon-Extraordinary to H. M. the King of the Belgians, Surgeon to University College Hospital.

About three years ago I placed on record, at the Royal Medical and Chirurgical Society of London, an account of a new method of treating obstinate stricture of the urethra. I have now had an increased experience of its capabilities; and I desire here, in few words, to describe the principles involved in the procedure, and the details necessary to be attended to in its application.

First, there is one very important fact which is in intimate relation with all treatment of urethral stricture; and it has been, as far as my observation extends, somewhat overlooked, or at all events it has not, I think, affected so prominently as it ought the surgical treatment of the malady. It is this: *that portion of the urethra which is most frequently affected by stricture possesses in its natural condition a calibre at least double that of the external meatus.* It follows then of necessity, that any kind of dilatation of the strictured portion which is limited in extent by the size of the external meatus does not half restore the natural calibre of the canal. In other words the external meatus having in any case a diameter equal to that of No. 12 of our catheter scale, the natural diameter of the bulbous portion will equal at least that of No. 16 or of No. 18—an area of more than double that of the former. Hence, if this latter portion becomes the subject of stricture, and the dilatation is carried no higher than No. 11 or 12, the stricture is not more than half dilated.

Practically, for the great majority of cases, such dilatation suffices for all purposes. The patient loses all his symptoms, and continues well on condition that he keeps open his stricture by occasionally passing an instrument. Happily, ordinary dilatation effects all this for most patients. For a few exceptional cases, however, it is insufficient to relieve the symptoms. The passing of a full-sized instrument does not enable the patient to pass even a tolerable stream; it often produces absolute retention, or rigors, or increased pain. For such a stricture we are accustomed to use some more efficient proceeding—e.g., to divide the hardened tissues (urethrotomy), or to burst them at a single operation (rupture). Each proceeding has been, and is, of considerable value when judiciously adapted to the case.

But I wish to remark that by neither of these operations is the urethra restored to its original calibre at the point of stricture. So long as the rupturing instrument or the dilating instrument is limited in its size by the calibre of the external meatus, the contracted portion of the urethra is only half dilated.

It is due to Reybard to say that he, perhaps more than any other surgeon, has recognised the necessity of bearing in mind this important truth. Advocating about the year 1850, extremely long and deep incisions as the treatment of stricture, his system soon fell into disrepute. He not only made these incisions to an extent which I believe to be both unnecessary and dangerous, but he was careful to keep apart the borders of the incisions for a long time after the operation by means of an instrument with two blades, which could be widely extended after their introduction into the urethra.

Now my own experience has convinced me that in many of these obstinate cases an equally perfect result may be accomplished by means of a powerful distending instrument without any incisions at all. The principle which underlies and regulates this proceeding is that on which I lay some stress, viz., to restore, if possible, the bulbous urethra to its natural size, regarding it as about twice that of the external meatus.

In order to effect this purpose, I have designed and employed an instrument which somewhat resembles others that have gone before it, but which have been differently used; such for example, as that referred to above and also some employed for gradual or slow dilatation, applied at intervals of two or three days during a considerable period of time. The main and the

important distinction consists in the method of employing it; in effecting the object by a single application only, instead of by numerous repetitions. My instrument, however, is much more powerful than its predecessors. It opens the bulbous urethra to more than double the size of the meatus, and acts mainly on the strictured, not on the healthy, portion of the urethra. When closed for introduction, it equals in size about a No. 5 catheter. As many strictures on which it is necessary to act are smaller in calibre than this, it is then essential to tie in a small gum catheter for thirty-six or forty-eight hours before employing it, in order to dilate the stricture temporarily to a sufficient size to admit the instrument. It is assumed, of course, that the stricture has been proved not to be permanently benefited by such (i. e., tying-in) dilatation, or the treatment about to be described would not be adopted. However narrow or retractile a stricture may be, it is always possible, by tying in, to dilate temporarily as far as to the required calibre.

The next principle which guides the treatment is this. Experience shows that most living tissues, if over-distended, lose to a great extent their natural elasticity. Thus the over-distension of the female urethra has often produced incurable incontinence arising from this cause—which is one instance only among others which might be adduced. The distending instrument I employ is composed of two parallel rods, which can be slowly separated by means of a screw in the handle, through the action of two levers which exist between them. In this manner the rods pass gradually and successively through all the numbers of the catheter scale, from 5 to 16 or 18, in obedience to the operator's action on the screw, and an index there marks the rate of movement for his information. When open, the two blades produce the figure of a very elongated spindle, the centre of which corresponds with the site of the stricture in the urethra. This position is easily ensured by means of the graduated scale marked on the stem of the instrument, and a small clamp which slides upon it. If the stricture is five inches from the orifice, this clamp is placed against the figure 5 on the stem, and the instrument is passed until the clamp acts against the external meatus. It is to be carefully maintained in this situation while the distension takes place.

Having so placed the instrument, nothing would be easier than to turn the screw rapidly, and at once raise the calibre of the strictured portion to the required size, say 16 or 18. This would effect its rupture, and is precisely that which I wish to avoid. I occupy from seven to ten minutes in slowly distending the part up to that calibre, and therefore prefer to give the patient the benefit of chloroform. Hence I *over-distend as much as possible, and rupture as little as possible.* The tightest fibres of all alone get ruptured; those which are less rigid yield to the distending force. The more I can accomplish the latter object, the more I avail myself of the principles just alluded to, and deprive the tissues of their elasticity. The more I accomplish by rupture, the more of a wound I produce, and consequently the more fear there is of rapidly returning contraction. Having reached the limit intended, the screw is slowly turned back until the index marks about No. 10, and the instrument is withdrawn. The instrument is designedly not entirely closed. A large gum catheter is passed, and tied in for twenty-four hours, a plan which appears preferable, although there is no more occasion to do this than there is after rupture, under which circumstances Mr. Holt dispenses with the catheter altogether. I pass no instrument for two days; then a full-sized bougie every day or two, prolonging the intervals, and teaching the patient to do it to himself occasionally afterwards.

A few words on the cases in which this proceeding is not applicable, or rather in which other treatment appears to me preferable. For an old and non-dilatable stricture within two or three inches of the meatus, I prefer internal urethrotomy. It is perfectly safe and easy if performed in that situation. Dilatation and rupture, in my experience, are both inadequate to produce any lasting benefit. I have heard of my mode being tried at the anterior part of the canal. I should not have advised it. The spongy body here is so much less extensible, so little porous, and so greatly fibrous,

as compared with its character where it constitutes the bulb, that but small room exists for extension. Hence in part the futility of ordinary dilatation as well as of over-distension in this situation.

Again, if a urethra is narrowed at several points—an unusual condition, but nevertheless one which is occasionally met with—I should prefer to adopt Mr. Holt's plan of rupture as, on the whole, the most certain to hit all the points of narrowing.

There remain then all the strictures, forming a great majority, which exist at from four to six inches from the meatus. For these, I may say, in one word, that, having employed all the mechanical methods of dealing with them that rest on sufficiently sound principles or on sufficiently good authority to merit trial, I know of none that has afforded me such good results, both in regard of the immediate object and of the enduring result, as the method I have endeavoured to delineate in this paper.

I could easily append, as illustrations of these remarks, numerous histories of patients so treated both in private and as hospital patients were it desirable, but it appears to me to be unnecessary.

I have applied this proceeding only for the most intractable cases which have come under my notice, having preferred always to employ ordinary dilatation (usually by tying in the gum catheter) when it was possible to accomplish my object by that safe and simple process.—*Lancet, June* 16, 1866, *p.* 655.

46.—CASE OF STRICTURE OF THE URETHRA; RETENTION OF URINE; PUNCTURE OF THE BLADDER PER RECTUM; PYÆMIA; RECOVERY.

By John Hilton, Esq., F. R. S., Surgeon to Guy's Hospital.

[The patient was a labourer aged 34, admitted into Guy's Hospital on Oct. 11. He had gonorrhœa twelve years ago, but it was not followed by symptoms of stricture. Eight years since, however, retention of urine followed an injury in the perineum from the pommel of a saddle. The urine which was then drawn off was bloody. Four years ago he had complete retention of urine, for which a No. 1 gum-elastic was passed; and he remained under treatment until the stricture admitted a No. 10. Since then the stream of urine has been gradually diminishing, and complete retention existed when he was brought into the hospital.]

On admission, he was put into a warm bath, and two grains of opium were administered. Silver and gum-elastic catheters were then tried, but failed to traverse the stricture. Warm oil was injected into the urethra, and a fine conical wax bougie tried, but without success. As the man was now much distressed, the bladder was punctured per rectum, and a large quantity of dark-coloured, highly ammoniacal urine drawn off. Half a grain of opium was administered shortly afterwards. He was much relieved by the operation.

Oct. 12th (second day). There has been much bleeding from the wound in the rectum, and a mixture of urine and blood comes both through and by the side of the canula. A bag of ice was ordered to be applied to the pubes, and another to the perineum. To take tincture of hyoscyamus and antimonial wine, of each twenty minims, in an ounce of acetate of ammonia mixture, every four hours; also, half a grain of opium pill three times a day.

13th (third day). Still a good deal of bleeding. After examining the patient per rectum, Mr. Hilton ascertained that the instrument had been thrust obliquely through the posterior part of the prostate gland, and traversed the prostatic portion of the urethra. There is considerable constitutional disturbance; hot skin; quick, small, and somewhat wiry pulse; anxious expression of countenance; dry, brown tongue; some tenderness on pressure over the pubic part of the abdomen. Ice to be continued; also the mixture.

16th (sixth day). Has remained in much the same state for the last three days. Blood is still mingled with the urine, though in less quantity, and there is now much pus with it. Still much tenderness just above the pubes, and some tendency to vomiting. As the bowels have not been open for some days, he is to have fifteen grains of calomel-and-colocynth pill immediately, and an enema if necessary; the opium pills to be continued after the bowels have been acted upon. Mr. Hilton tried to pass an elastic No. 4 through the urethra; but although the catheter went in a long way, he doubted if it had passed into the bladder, so a plug was placed within the rectum canula, in order to see, when the bladder became distended, if any urine would pass through the catheter. During the evening the man had severe rigors. Ordered brandy (three ounces) and soda-water.

17th (seventh day). As no urine had passed from the catheter—only a clot of blood,—a fine stilette was passed into the catheter to clear out any clots; and at about two-thirds its length it met with an obstruction, as if the catheter were bent abruptly upon itself. Urine flows both through and by the side of the rectum canula; it contains much pus, probably the result of suppuration between the bladder and pubes, but there is scarcely any blood in the urine.

18th (eighth day). The patient has had repeated rigors to-day, and is dangerously ill. Catheter and canula both removed. Opium to be discontinued; six ounces of wine ordered.

20th (Tenth day). Much better; slept pretty well last night. The urine passes readily from the rectum.

22nd (twelfth day). Small abscess opened in the perineum; half an ounce of pus evacuated. A few drops of urine subsequently passed from the penis. He passes urine by the rectum after retaining it in his bladder for three hours.

30th (twentieth day). About one ounce of urine passes by urethra at each effort of defecation.

Nov. 9th (thirtieth day.) Urine has passed twice exclusively by urethra; stream small.

11th (thirty-second day). He had much sore throat, with difficulty of swallowing, for some days. A considerable abscess is forming in the median line of the neck, and pointing anteriorly. In the evening it is opened.

12th (thirty-third day). The throat is no longer sore, and he feels much better. Ordered to be up a little every day.

20th (forty-first day). Mr. Hilton tried to pass an elastic No. 3, but only succeeded in getting it within the stricture, and into the prostatic portion of the urethra. It was retained an hour or two, and then withdrawn. Apparently it induced a spasmodic state of the stricture, for he could not pass any urine through the urethra for some hours afterwards. He occasionally passes a little urine by the rectum.

22nd (forty-third day). No. 5 catheter passed easily into the bladder to-day, and the urine came away through it.

Dec. 2nd (fifty-third day). The urethra has been gradually dilated, so that a No. 9 catheter passes easily. Another abscess, preceded by an attack of sore-throat, has formed in exactly the same position in the neck as the former one; it opened spontaneously to-day. Ordered one ounce of quinine mixture three times a day.

5th (fifty-sixth day). Passed an elastic No. 9 himself in the presence of the dresser. At his own request he was allowed to leave, with orders to pass the catheter himself every day for some time to come, and to re-present himself at the hospital if he experienced any difficulty.

18th (sixty-ninth day). No urine by the rectum. He passes a No. 9 catheter when he wishes to void urine. Health good. He is doing well.

Observations.—Twelve years ago he had gonorrhœa, and no symptoms of stricture of his urethra followed; yet with this same malady a patient does not always so lightly escape. Now, why should one man have a stricture after gonorrhœa and another not? I have a drawing here that represents the urethra divided longitudinally, and laid open, so as to expose its mucous

surface. The original preparation was taken from the body of a man, who died suddenly of some internal disease, whilst suffering from acute gonorrhœa. The gonorrhœal inflammation, you will see, occupies the anterior third or half of the urethra, whilst stricture usually occurs in the bulbous or membranous portion—that is, altogether behind the portion attacked in acute gonorrhœa. The interpretation of this may be found primarily in the fact that the acute inflammation, through injudicious local treatment (as by the oftentimes adopted but stupid method of placing a piece of lint or some cotton-wool upon the mouth of the urethra, in order to prevent the escape of the discharge, by which plan no doubt the shirt is kept clean, but the retention of the gonorrhœal fluid within the urethra ensures not only the intensification but the extension backwards of the inflammatory condition; or by the injudicious employment of strong astringent, irritating injections, catheterism, &c.) or through indiscretions on the part of the patient, is made a chronic affair. The chronic inflammation travels back and reaches the equally vascular, more loose, more mascular, and more sensitive parts of the urethra—the bulbous and membranous portions. Inflammatory lymph is then effused into the submucous tissue, which lymph more readily encroaches upon the calibre of the canal in this situation, because the urethral wall is not at those parts so closely united to the surrounding tissues. The urine then passes with difficulty, and the additional effort made to expel it excites the canal at the strictured part and behind it. A catheter is used, perhaps wounds the mucous membrane, and a permanent stricture may be the result of this complication of troubles. An attack of gonorrhœa, unless very acute or very enduring, will give rise to no stricture, provided it be treated properly, and the patient take care of himself, committing no indiscretion as regards diet, women, or mode of living generally. For the gonorrhœal inflammation is subservient to the general law, that all local inflammations are modified by the state of the general health, whether the inflammation be of the urethra, or of any other part of the body.

The explanation of the acute inflammation becoming at first localized within the anterior part of the canal is probably due to the manner in which the local disease is contracted. It may result from the forced contact of the morbid fluid with the meatus, and thence its extension upwards. There is another probable explanation—namely, that during coitus, and immediately after the seminal emission, a vacuum is produced in the fossa navicularis of the urethra; and some of the morbid fluid from the vagina of the female is forced by atmospheric pressure through the meatus, and is thus brought into direct contact with that portion of the urethra which observation declares to be the early seat of the gonorrhœal inflammation. Otherwise than by some such manner, it is unintelligible how the gonorrhœal fluid can enter the male organ. I believe that gonorrhœa is produced by this unhealthy fluid being allowed to remain during some time upon the os urethræ or within the fossa navicularis, and so inoculating the mucous membrane. Practically, if this be true, it points to the advantage likely to accrue to the male by his passing his urine forcibly soon after connexion, in order to wash out the gonorrhœal fluid.

But to return to our case. Eight years ago the patient received an injury in the perineum from the pommel of a saddle. We cannot tell positively if the urethra was then wounded; but it is a fair supposition that it suffered some amount of damage, such as contusion or laceration opposite the perineum; for from that moment he had retention of urine, so that a catheter was needed to remove from his bladder a large quantity of bloody urine. He forgets whether blood flowed from the meatus directly after the accident, which would certainly indicate laceration of the urethra; or whether it came mixed with urine, &c. At any rate, ever since the accident he has suffered from stricture; so I conclude the urethra was then injured, and a true traumatic stricture resulted,

As a digression, we will see what should be done in case any of you are called to a man who has suffered an injury in the perineum, such as might be produced by a fall upon the pommel of his saddle. First of all, do not

ask the man to pass urine, because if his urethra be lacerated, his straining efforts at micturition may cause extravasation of urine at the seat of injury; but pass a catheter, and draw off his urine. Should the instrument go in easily, and not any blood appear, you may be tolerably sure that the urethra has suffered no material damage. If you cannot pass the catheter, leave him alone for a while, and give him opium. The purpose intended by the administration of this drug I will presently explain. But if you are certain from the appearance of blood upon his shirt and blood escaping from his penis, without an external wound to account for it, that the man has laceration of the urethra, then you must if possible, and without delay, pass a catheter of a large size—one that enters freely the meatus; for a large catheter is likely to push aside the torn pieces of the urethra, and place them again in their proper position, whilst a small one is more likely to enter the wound of the urethra. The catheter is to be passed for two purposes—firstly, to relieve the man of his retention of urine; secondly, to prevent the urine passing from the lacerated urethra, and extravasating into the adjoining tissues. Now, if you cannot pass the catheter, you must accomplish the two purposes you have in view by some other means, which you do by cutting into the middle line of the perineum behind the seat of injury, and opening the urethra, and then passing a female or gum-elastic catheter through the perineal opening into the bladder. If from the great stoutness of the patient, or from some other cause, you deem that great difficulty, and possibly failure, may attend this operation, you must puncture the bladder by the rectum, and then after a while you will probably be able to introduce a catheter through the urethra; for the bar to the catheter introduction may have been caused by swelling, the result of the local injury, which will have subsided.

Four years ago this man had complete retention: this was but part and parcel of his malady. The wound in the urethra, which was caused eight years ago, was healed by the effusion of lymph at the part; this cicatricial lymph afterwards contracted (as is the case with lymph in most cicatrices when frequently disturbed by either normal or abnormal function), the calibre of the canal was encroached upon, and at length (perhaps from some indiscretion at the time upon his part) complete retention was caused. A small catheter was, however, introduced; and the stricture was cured by dilatation. Had he then continued to pass the catheter once or twice a week, he would probably have remained all right; but he neglected himself, and consulted some quack, who, as he said, had during six months been "working away at his passage" with a No. 1 catheter without success. The cicatrix had again contracted, till at last, two days before his admission here, he had complete retention of urine.

In dealing with ordinary cases of stricture, whether from injury or from chronic inflammation, my advice is that you do not adopt *vi et armis* the heroic line in their treatment, but pursue the plan of slow dilatation by catheters of gradually increasing size. You must remember that many of the cases you see in this hospital are exceptional ones—much more severe than those you will hereafter meet with in private practice. You may, perhaps, in the course of a large practice and a long life, meet with one or two as aggravated as many of those admitted here, in which it is impossible to introduce a catheter. Your patients will come to you as soon as they find the stream of urine getting less, and you will be able to arrest the course of the complaint and to effect a cure by dilatation. Some surgeons in the North declare that they can pass an instrument through any stricture. On the other hand, surgeons in London meet with cases where they fail to pass a catheter. So that it comes to this: either the London surgeons are inferior in manipulative dexterity, or the cases they treat are more severe. Dr. Frederick Hughes Hewitt, formerly a distinguished student at Guy's, who spent many months in Edinburgh a few years ago, informed me that he never saw there cases of stricture so severe and so complicated as many of those he has seen in Guy's. What may be the explanation of this difference I cannot say.

The patient, then, came to us with complete retention, and was treated first

with opium. Upon what rule? Because, usually, spasm of the urethral muscles is superadded to an inflamed state of the urethra in cases of stricture; and it is the muscular spasm which at length completes the retention. You put the man into a warm bath, give opium, and administer chloroform; all these agents annihilate muscular spasm, and usually render it possible for you to pass a catheter, or for the patient to micturate. In our patient the cause of the stricture was persistent, and had been persistently increasing for four years before his admission; this shows that it was not spasm alone, but a continually increasing thickening of the walls of the urethra, although in this case limited to the actual seat of stricture. And I may add that the strictured part was very sensitive and painful to the touch. Very little surrounding thickening could be felt in this instance, and the case was one in which false passages can be easily made, as is very frequently done by using force in catheterism. Had the patient come to us before his condition was so extreme, would it have been possible to prevent the complete retention? Certainly. I tell you most distinctly and emphatically that many cases of stricture may be cured by medicinal treatment and improving the general health. With a view to the absorption of the chronic inflammatory thickening, I should have given him small doses of mercury and chalk twice a day, adding Dover's powder in order to quell muscular spasm. Further, the patient would have been kept in the recumbent position (this advice applies to all prostatic and urethral affections), by which means you displace by gravitation the congestion of blood-vessels.

But, after the warm bath and the opium, it was still found impossible to pass a catheter, so (in my absence) puncture of the bladder by the rectum was performed. Now, how is this operation best to be done? First, put the patient as systematically in the proper position for the operation as if you were going to cut him for stone; then pass your forefinger into the rectum, in order to feel and examine well the prostate. When in going round my wards I have any case where a digital examination of the rectum will assist the diagnosis, I make it a point to invite my dressers and some others of the class to do the same, for the purpose of enabling them to familiarize their finger with the healthy or unhealthy state of the prostate. First, one shrugs his shoulders and turns away; his fingers are too delicate for such a dirty place. Then another has gloves on or his hands in his pockets, and thinks it a nasty thing to do; and in the end only a few are found to follow my example. This is not right, for the only opportunity by which you can gain experience in such matters is whilst at the hospital, and I beseech you to do it as often as possible. It is a bit of experience which will be worth a great deal to you hereafter. The truth of my words some of you will perhaps realize, when some rich old gentleman, willing to pay anything for really good attendance, is getting fidgety, because you, not knowing the cause of his malady, cannot cure him. Well, then, pray do examine the prostate, in order to familiarize the finger with its form, proper configuration, and normal degree of resistance at different periods of life, and to know if it be softened or hardened, &c. Before performing the operation of puncturing the bladder by the rectum. it is especially necessary to be able to feel the prostate with precision. You may sometimes, perhaps generally, feel the lower part of the distended bladder projecting downwards from behind and above the prostate; but not always so, for sometimes the bladder is drawn or dragged upwards into the abdomen, and the fuller the blader in these latter cases the less can you generally feel of it by the rectum. But you *can* always in these same cases feel the distended bladder by pressing it down from the front of the abdomen into the pelvis with one hand, and by placing the finger of the other hand within the rectum. Why do these differences in the position of the distended bladder obtain in different persons? A short urachus, which acts as a suspensory ligament of the bladder to the umbilicus, will retain the organ forwards and upwards; perhaps also other causes may tend to hold it within the abdomen rather than in the pelvis.

In performing the operation, let there be no hurry: feel the prostate well;

keep your eye fixed on the pubes or the umbilicus, so as to guide your finger exactly in the median line, and if possible push your finger beyond the prostate. These little points all help to make the operation successful. If you deviate from the median line, you are sure to do mischief, by wounding the vas deferens, or puncturing an artery or veins. These are amongst the most common casualties associated with this operation. If you do not feel the bladder, be sure it is one of those cases where it is raised into the abdomen; get an assistant to push it down, and to keep his hand there until you feel the bladder and have punctured it. Upon the introduction of the trocar and canula the urine comes away.

On the day following the operation much blood escaped from the wound in the rectum, so I ordered a bag of ice to be applied over the pubes and another to the perineum. Next day, the hemorrhage still continued, although lessened. I could not help thinking something had gone wrong. I therefore examined the patient per rectum, and found that the instrument had been thrust by the operator obliquely through the prostate gland and the posterior part of the prostatic portion of the urethra, and most likely wounded the front wall of the bladder behind the pubes. The man was suffering from much constitutional disturbance, of which he had all the usual symptoms; further, he had great tenderness over the lower part of the abdomen, and a tendency to vomiting, showing inflammation either within or near the bladder—all bad indications, prospectively at any rate. The projecting end of the trocar only had probably just pierced the front wall of the bladder sufficiently to allow of slight extravasation of urine behind the pubes, and this, I apprehend, was the cause of both the tenderness there upon pressure, and of the constitutional disturbance. Now there is occasionally, but very rarely, an artery or veins near the median line of the bladder behind the prostate; so that if you puncture the bladder (not the prostate) with precision in that line, you might wound a blood-vessel there or in the walls of the rectum. Such a casualty is unavoidable. You may open a small vessel at the part, but it will not bleed much. I have no doubt I did in one case puncture the vas deferens by not keeping the instrument precisely in the median line. The man subsequently had inflammation in the testicle of that side, and finally the testicle became atrophied.

Seeing that the canula (in the case now occupying our attention) had certainly gone elsewhere than merely into the cavity of the bladder, on the sixth day I thought it best to try and pass a catheter, hoping to dispense with the further presence of the canula within the rectum and bladder. For this purpose I endeavoured to pass a No. 4 gum-elastic catheter. It went as far as the canula within the prostate, and then turned; so that I could not tell where it had gone. I was anxious to know if it had entered the bladder; and, to prove or disprove the point, I plugged the canula, so as to prevent the urine from passing by the rectum. On the next day no urine had come by the catheter, which, as it turned out subsequently, was bent on itself, and had not entered the bladder at all.

On the eighth day the man was obviously going down hill. The canula had transfixed the prostate obliquely; and this alone was a source of great irritation. It was besides, impossible to tell with precision where the point of the trocar had gone; and, in withdrawing the canula, there was some risk of retention or of extravasation of urine. The canula has two purposes to accomplish; to relieve the retention, and to relieve the stricture also, which latter purpose it effects by allowing the strictured part to be at perfect rest, with no urine pressing against it or passing over it; and, as a rule, you do not withdraw the canula until the man can pass urine by the urethra, or a catheter can be introduced by the urethra into the bladder. This, however, was not a simple case, and we were not able to wait until the urine came by the penis; so, although by withdrawing the canula we ran the chance of permitting some mischief to occur, yet it was a choice of evils, for he was tending to death, and he must submit to his risk. Two days subsequently a marked improvement in his condition was perceptible, showing that we were right in withdrawing the instrument, although we acted contrary to the rule that the

canula is not to be withdrawn until the patient can pass urine, or the surgeon introduce a catheter. The hole through the prostate into the bladder was probably valvular; hence the fact that he could retain his urine for about three hours, after which the rectum received the contents of the bladder.

Four days after the removal of the canula an abscess was detected in the perineum, the effect probably of the local irritation excited by the stricture, the attempts at catheterism, &c. When the abscess was opened about half an ounce of pus escaped by the hole in the perineum. Urine began directly afterwards to flow from the urethra. I think, then, the fair supposition is, that the abscess, by the pressure upon the urethra it exercised before it was opened, prevented the passage of water through the urethra.

The man at this time had an abscess in the front median line of his neck. It might have been caused by some local injury; but the fact of its being so symmetrically in the middle line favours the supposition of its having its origin in some constitutional or generally diffused affection—a blood-poison, as pyæmia. An abscess in the median line, which affects consequently both sides alike, is usually caused by a constitutional disorder. A carbuncle is usually in the median line, as the nape of the neck, the back, or abdomen; or it may be equally developed on both sides of the body. Boils, cutaneous eruptions, and scrofulous glands (each arising from a generally-diffused cause) are also situate either in the median line, or are bilaterally symmetrical. Pyæmia is less controlled by this rule than any other blood-poison, for it does not at all necessarily show symmetry in its secondary suppurations. Pyæmic superficial abscesses are probably obedient to, and subserve, the rule of previous deterioration of structure. When a man has an impaired state of health—and it is always very much impaired in pyæmia—any previously deteriorated part of his body is the most likely to suffer. The internal suppurations, however, seem to follow the formula of "local symptoms being symmetrical in general blood affections." The fact of abscesses occurring in the liver, which is not symmetrically placed in the body, does not invalidate this position; for the lungs and liver may both be regarded as central organs, seeing that all the blood of the system goes through the former, and all the portal circulation traverses the latter. There must have been some determining cause for this large abscess in the median line, so far removed from the seat of his bladder. We must not shelter ourselves under the obscurity of "coincidence" or "anomalous," but endeavour to draw aside the curtain that at present veils the true cause from our view. Think over this matter; ask yourselves, what can be the explanation? Reason it out for yourselves. You may fail to discover the interpretation, but you will have rightly exercised your high prerogative of reason.—*Lancet, July* 28, 1866, *p.* 87.

47.—ON THE MEANS TO BE ADOPTED FOR ESTABLISHING A COMMUNICATION BETWEEN THE BLADDER AND THE EXTERIOR OF THE BODY, WHEN THE URETHRA HAS BECOME IMPERMEABLE.

By Edward Cock, Esq., Senior Surgeon to Guy's Hospital.

In this short communication I have no intention of alluding to the treatment of ordinary stricture; nor shall I yield to the temptation of criticising the various methods and appliances which, within the last few years, have been either invented or resuscitated for the purpose of restoring a narrowed urethra to its normal condition. Some ingenious mechanical contrivances cut, some tear, some burst, some are supposed to dilate with marvellous rapidity. My objection to their use is founded on a forty-years' experience, which has taught me that such cutting, tearing, bursting, or rapid dilatation is often exceedingly mischievous in its effects, and fails in establishing a permanent cure, and that the object in view may be accomplished by much milder, surer, and safer means.

The purport of this paper is not to show how a strictured urethra may be treated, but how the bladder may be got at when the canal has become positively and absolutely impermeable to instruments of every description.

Some years ago I sent to the Medico-Chururgical Society a paper, which was read and published in the "Transactions," detailing my experience in the operation of puncturing the bladder through the rectum.

The object which I then had in view was to prove, by the test of experience in forty cases, that this operation is safe, easy of accomplishment, and without danger as to its consequences, and that in cases of retention which resist ordinary treatment it is greatly to be preferred to long-continued attempts at catheterism, which, whether successful or not, must be infinitely more injurious to the urinary organs than the simple and almost painless operation of tapping.

I consider that the benefit of the operation consists not merely in the immediate relief given to the patient, but also in the opportunity which it affords, by the retention of the canula in the bladder through an indefinite period, of diverting the flow of urine from its ordinary channel, and thus giving quiet, freedom from pain, and the natural means of restoration to the maimed, irritable, or diseased urethra.

From this point of view I conceived that the bladder might be tapped with advantage in cases of obstinate stricture, in which retention of urine did not actually exist.

I wished to rescue the operation from the obloquy which had been cast upon it by every surgical writer, as a desperate kill or cure remedy, only to be used when every other means had failed; and to restore it to its legitimate place in the category of surgical means and appliances.

It is gratifying to know that since the publication of my paper in the "Transactions," the bladder has been tapped by many surgeons, and that even some of the warmest opponents to the operation have since received it as a very available friend in need.

Still, however useful and available may be the means of relieving the bladder by tapping through the rectum, this operation does not fulfil every necessity that may arise; for, to ensure a successful result, certain conditions are required, which do not always exist. An empty, habitually-contracted bladder, and a very large prostate, are almost fatal objections to the operation.

A class of cases not unfrequently come under our observation, where the bladder must be got at somehow to save the life of the patient, and where yet it cannot be reached, either by ordinary catheterism through the urethra, or by tapping above the pubes or through the rectum.

We tap the bladder because it is distended and we cannot pass a catheter. But there are other conditions of the bladder more chronic, yet not less fatal, than acute retention. Every surgeon must be familiar with cases where stricture has existed for a number of years; where the urethra has become permanently obstructed, or destroyed by constant pressure of urine from behind, and by reiterated attempts, generally fruitless, to introduce an instrument; where extravasation into the perineum has again and again taken place, causing repeated abscesses and their consequences, the formation of urinary sinuses and fistulæ, until the normal textures of the perineum become obliterated, and are replaced by an indurated, gristly structure; where the bladder has become thickened, and contracted by the constant action of its muscular coat until little or no cavity is left; and where the urine is constantly distilling by drops, either through the urethra or through one or several fistulous openings, which dot the surface of the perineum, penetrate through the indurated scrotum, and even find their way to the nates below, and the region of the pubes above. If unrelieved, these cases invariably terminate fatally. The patient slowly sinks under his constant efforts to micturate, and the unceasing fever and constitutional irritation produced by the passage of the urine through the abnormal channels, and the frequent formation of fresh abscesses. Finally, the ureters and pelves of the kidneys become dilated; renal disease is set up; and the patient at length dies with symptoms of blood-poisoning by urea.

To remedy this complication of evils—viz., an impermeable urethra; a disorganized perineum, of which all, or nearly all, the anatomical features

have disappeared; fistulous sinuses communicating with the urethra, and distilling urine; recurrent abscesses from the irritation of the extravasated fluid; broken down health from diseased bladder, the forerunner of renal disorganisation;—I say, to give the patient a chance of life or restoration, it is necessary to establish a free communication between the bladder and the exterior.

The natural passage through the urethra is not available, as the channel has long been rendered impermeable or altogether destroyed. The sound and catheter are therefore useless; while the contracted condition of the bladder forbids the operation of puncture behind the prostate.

The surgical means adopted in these miserable cases should have a twofold object in view—an immediate and a more distant result. The one object is the prompt establishment of a free communication with the bladder behind the obstruction. The second and more remote is the restoration of the urethra to its normal condition, so far as this may be possible.

The operation which is recommended and described in most books of surgery proposes to combine both these objects—the relief of the bladder, and the cure of the stricture. It consists simply in effecting a union between the two permeable portions of the urethra, by cutting down upon and dividing the intermediate strictured and obstructed portion. "The urethra is opened anterior to the stricture on a staff carried down to the spot. The stricture is then to be traced backwards, and divided until the canal behind it is reached and laid open. A flexible catheter is then to be introduced through the urethra into the bladder, a portion of the catheter representing the splice between the two permeable portions of the canal. The wound fills up and unites over the catheter, and the cure is then complete."

The theory is plausible and good, could it be carried out, but the practice is most difficult, tedious, and severe; often fatal, and always unsatisfactory as regards the ulterior result. Even if all the tissues of the perineum were in a healthy normal state it would be most difficult, often impossible, to lay open a stricture which lies at the bottom of the wound, and which has long been impermeable to the smallest instrument, and can neither be seen nor felt by the operator. I have frequently seen this operation performed, or rather attempted; and I doubt whether in any one instance the original intentions of the surgeon were carried out. In several instances death followed as a consequence of the operation, and a *post-mortem* examination revealed that, although all the structures of the perineum had been most unnecessarily incised and damaged above, below, before, behind, and round about the stricture, it was the stricture alone which had escaped untouched and without mutilation, while the catheter had been carried out of the canal above the stricture, and re-inserted below. This very circumstance is fatal to the prospects of a permanent cure, for the splice, not consisting of restored urethral tissue lined by mucous membrane, but being a mere factitious canal, formed by granulations around the catheter, will begin to contract as soon as the use of the instrument is abandoned, and will, at no very distant period, become again impermeable. I need scarcely say how all the difficulties I have described must be multiplied when the perineum is swollen, indurated and perforated by sinuses, when every anatomical guide that could be appreciated by sight or touch has disappeared, and when it is impossible to ascertain how far backwards the obstructed and diseased portion of the urethra extends; and yet these are precisely the cases in which surgical interference is necessary.

For many years I have adopted another operation, which is at once easier, simpler, and much more successful; for the objects aimed at in the operation I am about to describe can be accomplished, while I doubt if those of the other have ever been fulfilled.

However complicated may be the derangement of the perineum, and however extensive the obstruction of the urethra, one portion of the canal behind the stricture is always healthy, and often dilated, and is accessible to the knife of the surgeon. I mean that portion of the urethra which emerges from the apex of the prostate—a part which is never the subject of stricture,

and whose exact anatomical position may be brought under the recognition of the finger of the operator.

Thus, when we cannot introduce a catheter by the ordinary method, and even when we cannot tap the bladder through the rectum, it still remains to us to tap the urethra as it emerges from the prostate, and thus to effect the desired communication.

There are considerable advantages attending this operation. The bladder is reached without any unnecessary mutilation of the perineum. The communication is effected in nearly a straight line from the exterior to the cavity of the viscus; so that the canula, which is inserted and retained, can be removed whenever necessary, and can be easily replaced. The functions of the entire urethra are suspended, and may be kept in abeyance for an unlimited period. The urine no longer finds its way abnormally through the stricture and sinuses of the perineum. The tissues are no longer subjected to constant irritation from infiltration. The constitutional symptoms are relieved, and time and opportunity are given for the removal, by absorption, of those adventitious deposits which obstructed the urethra, indurated the perineum, and rendered the introduction of an instrument impossible. The pressure on the kidneys is removed, and, if expedient, the bladder may be readily washed out, until its lining membrane assumes a healthy character. The strictured and damaged portion of the urethra, being no longer subjected to a constant pressure of urine from behind, may probably so far recover itself as to allow of restoration by the ordinary means of dilatation; or, should the canal have become permanently obliterated, the patient still retains the means of emptying his bladder through the artificial opening without difficulty or distress, and at very moderate inconvenience to himself.

This operation (which for the sake of distinction), I may call "tapping the urethra at the apex of the prostate, unassisted by a guide staff," is alluded to in some books on surgery, but does not appear to have found much practical favour. I have performed it many times, but have seldom seen it attempted by others. Indeed, I do not think that the mode of procedure recommended in surgical works and manuals is likely to lead to a successful result; for it is made to depend on a slow and protracted anatomical dissection, through strictures where, almost invariably, all anatomy has been destroyed, or if present, cannot be brought under the eye of the operator.

My experience has suggested the following method of reaching the urethra; and by adopting it I have never failed to accomplish the object in view,

The only instruments required are, a *broad* double-edged knife, with a very sharp point; a large silver probe-pointed director, with a handle; and a canula, or a female catheter modified so that it can be retained in the bladder.

The patient is to be placed in the usual position for lithotomy; and it is of the utmost importance that the body and pelvis should be straight, so that the median line may be accurately preserved. The left forefinger of the operator is then introduced into the rectum, the bearings of the prostate are carefully examined and ascertained, and the tip of the finger is lodged at the apex of the gland. The knife is then plunged steadily but boldly into the median line of the perineum, and carried on in a direction towards the tip of the left forefinger, which lies in the rectum. At the same time, by an upward and downward movement, the vertical incision may be carried in the median line to any extent that is considered desirable. The lower extremity of the wound should come to within about half an inch of the anus.

The knife should never be withdrawn in its progress toward the apex of the prostate; but its onward course must be steadily maintained, until its point can be felt in close proximity to the tip of the left forefinger. When the operator has fully assured himself as to the relative positions of his finger, the apex of the prostate, and the point of his knife, the latter is to be advanced with a motion somewhat obliquely either to the right or the left, and it can hardly fail to pierce the urethra.

If, in this step of the operation, the anterior extremity of the prostate should be somewhat incised, it is a matter of no consequence.

In this operation it is of the utmost importance that the knife be not removed

from the wound, and that no deviation be made from its original direction, until the object is accomplished. If the knife be prematurely removed, it will, probably, when reinserted, make a fresh incision, and complicate the desired result. It will be seen that the wound, when completed, represents a triangle; the base being the external vertical incision through the perineum, while the apex, and consequently the point of the knife, impinges on the apex of the prostate. This shape of the wound facilitates the next step of the operation.

The knife is now withdrawn, but the left forefinger is still retained in the rectum. The probe-pointed director is carried through the wound, and, guided by the left forefinger, enters the urethra and is passed into the bladder. The finger is now withdrawn from the rectum; the left hand grasps the director, and along the groove of this instrument the canula is slid until it enters the bladder.

The operation is now complete, and it only remains to secure the canula in its place with four pieces of tape, which are fastened to a girth round the loins. There will probably be no escape of urine until the stilette is removed from the catheter.

A direct communication with the bladder has now been obtained, and the relief to the patient will be immediate. Unless the kidneys have become irremediably disorganized, we may confidently anticipate a favourable result; and the restoration of the urinary organs will be more or less complete, in proportion as the obstructed portion of the urethra is more or less amenable to the ordinary judicious treatment of stricture. The canula may generally be retained in the bladder for a few days, and if the state of the urine renders ablution necessary, the viscus may be frequently washed out. The canula may then be removed, cleaned, and reintroduced. A flexible catheter is sometimes more desirable and congenial to the feelings of the patient than a metallic canula.

[To keep the artificial passage in a permeable state, it is generally necessary to pass a flexible bougie through the opening occasionally, and to retain it *in situ* for a few hours. The patient very soon learns to do this for himself.]—*Guy's Hospital Reports, Vol. XII, p. 267.*

48.—ON LITHOTRITY.

By T. Pridgin Teale, Jun., Esq., M. A., Surgeon to the Leeds General Infirmary.

[After relating and comparing a number of cases of lithotomy and lithotrity, Mr. Teale offers the following remarks.]

1. Where there is no impediment to the passage of the lithotrite either in the urethra or prostate, and where the bladder can retain sufficient urine to allow the lithotrite to be worked with safety, I believe that most calculi which can be grasped and broken through admit of being safely dealt with by lithotrity.

2. Where no injury has been done to the bladder in using the lithotrite, the stone when broken into fragments is less distressing to the bladder than in its unbroken state. Should this fact, observed by Sir Benjamin Brodie and others, and confirmed by several cases of my own, prove to be generally true, it will still further reduce the question between lithotomy and lithotrity to one of the possibility of breaking the stone by the lithotrite.

3. If a fragment of stone can pass the neck of the bladder and the prostatic portion of the urethra, it can generally traverse the remainder of the urethra without difficulty. I only remember one instance in these cases in which a fragment had to be removed from the urethra, and this was arrested in the glans by the narrow meatus.

4. In several cases, especially in the latter ones, very large fragments have been passed. The passage of large fragments is a good symptom—a sign that the neck of the bladder and the prostate have suffered but little from the use of the lithotrite. We often find that only a few fragments are passed during the first twenty-four hours after lithotrity; then small fragments

appear in greater number, and lastly the larger ones. In such instances the prostate has become swollen, and thus opposes a temporary barrier to the escape of the stone; but as the swelling subsides the freedom of the passage is restored, and the fragments begin to come away.

5. As to the reduced risk to life from the adoption of lithotrity, I would not venture to say a word from such a small number of cases as my own. I may, however, appeal to the experience of others. Mr. Henry Thompson, in his work on Lithotomy and Lithotrity, records the results of 1827 cases of lithotomy, which he had collected from various sources. The fatal cases were 229, or 1 in 8; or if those below the age of sixteen be taken alone, there was a mortality of 1 in 17½; if those above sixteen years be taken, a mortality of 1 in 5¼. Sir B. Brodie, in 115 cases of lithotrity, had a mortality of only 1 in 12½. Mr. Henry Thompson has recently published a series of 43 cases of lithotrity in succession without a death. If, therefore, the mortality in adult stone cases, which is usually 1 in 5 or 6, can be reduced to a mortality of 1 in 12½, or even to a much smaller proportion than this, there can be no question as to the value of the operation by which this result can be obtained.

6. Though my cases are not numerous enough to give any reliable data about the fatality of the operation, there are other points in which they can be favourably compared with lithotomy. One patient was cured in one operation, and left the hospital and resumed his work in ten days. A second underwent two operations in the hospital, left at the end of a week, and resumed his work; had a third sitting as an out patient, and was well in less than a month. A third was under my care in lodgings for a fortnight, where he underwent three operations. He then returned home, and resumed his employment; and, after three more sittings, at my own house—after which he returned home by railway,—was well in a month. A fourth remained in lodgings three days after the first sitting; after each of five subsequent sittings he returned home by train the same day, and was well in seven weeks and a half. These latter patients have not been confined to bed except for half a day after the earlier sittings.

In conclusion, let me remind you that lithotrity is an operation in which success depends upon attention to minute and delicate details. The stone must be crushed; but the bladder must not be injured. Operations too much prolonged, or repeated at too short intervals, retard progress. Therefore it is that, in order to test my own progress and to learn as much as possible by my own experience, I carefully note in these cases the date of each sitting, and the number of times the lithotrite is screwed down upon the fragments, the weight of fragments passed after each sitting, and the number of days or parts of days that each patient is compelled to remain in bed.—*Lancet, Sept.* 29, 1866, *p.* 349.

49.—A NEW INSTRUMENT FOR REMOVING THE SMALLER FRAGMENTS OF CALCULUS AFTER THE OPERATION OF LITHOTRITY.

By John Wood, Esq., King's College Hospital.

[Mr. Wood has invented an ingenious instrument with which he proposes to remove the detritus remaining in the bladder after the calculus has been crushed.]

It consists of a silver catheter (of which several sizes have been made), having a large oval opening on its convex surface. Within this works a stout piston-rod packed with cork. Attached to the extremity of this rod is a piece of watch-spring, which moves in the bend of the catheter and carries at the end a scoop, and in the middle three small catches, the object of these being that when the sedimentary water in the bladder is pumped out by the piston, the small fragments and particles of stone being thus brought by the suction to the opening in the catheter, they may be caught and withdrawn by the scoop and catches placed on the flexible termination of the piston.—*Medical Times and Gazette, Oct.* 13, 1866, *p.* 394.

DISEASES OF THE SKIN.

50.—ON ECZEMA.

By Dr. T. W. Belcher, M. A., Physician to the Dublin Dispensary for Skin Diseases, &c.

[The patient whose case forms the text of the following paper was three and a half years of age, and had an eczematous eruption on the scalp of several months' standing.]

I directed the hair to be cut close, and kept so by repeated use of the scissors; to keep the scalp clean, and to apply with a brush the strong tincture of iodine, which I generally use for such purposes. It is made with methylated spirit instead of with proof spirit; and in this I think it has a great advantage over the officinal preparation in any affections for which the local use of tarry preparations, or of medicines allied thereto, may be thought desirable.

The application was repeated several times, and during this period she occasionally took alterative powders of mercury with chalk.

On the 4th of April (1864), she showed symptoms of what is often called "a bad state of the system," by the breaking out of small boils on the scalp.

Cod-liver oil, in drachm doses, thrice daily, was given from this date; and on the 16th of May she was discharged cured of the skin disease, and very much improved in her general health.

I shall now give an illustration of a different form of eczema.

J. H., aged 19, by occupation a porter, was admitted to the dispensary on the 18th of April, 1865, with a (nearly) circular eczematous eruption on both arms and legs, and on the scrotum. I arrived at the conclusion that it was a case of eczema *impetiginodes*, for the following reasons:—

From some of the patches arose a serous, from others a sero-purulent exudation; but on nearly all there was to be seen a constant formation of yellowish-brown scabs.

The quantity of the discharge was very great in this case; I have never seen it greater in any other, and it was a source of much inconvenience as well as annoyance to the patient, who had all the while to follow his daily labour. The tincture of iodine was applied here after the manner detailed in the last case; it was frequently repeated, and throughout the patient took the solution of the arseniate of soda (Pearson's solution) in three-minim doses, thrice daily. At first he took it in infusion of quassia; after a while this was changed to infusion of gentian; and finally, the vehicle used was infusion of cascarilla. The patient steadily improved, and all traces of the disease having for a short time disappeared, he was discharged, apparently cured, on the 21st of July, taking the arsenical mixture up to that day. His treatment lasted about three months. He was very well afterwards until about the middle of last month (March, 1866), when he again came to the dispensary with a very slight return of his former malady. I may return to his case in a future paper.

Eczema in a more ordinary and a more closely typical form occurs frequently on the scalp of infants during teething. On reference to my private case-book, I find that just about the same time (April, 1865), I was attending a gentleman's child, aged about five months, who was affected in this way. The tincture of iodine was applied in this case also, and when it had stopped the copious "weeping," I resorted to ointments to allay the intolerable itching which the little patient felt. I tried first of all Prof. Macnamara's "Ceratum lauro-cerasi," (see his edition of "Neligan's Medicines," p. 292). This soon lost its effect, and then I tried, with more success, a cerate of cold cream with chloroform, twenty minims to the ounce. Finally, I completely succeeded with thirty minims of it to the ounce. The cerate was kept in a stopped phial, and throughout the child had alterative, and occasionally purgative medicines.

I think we may deduce some practical lessons from the consideration of eczema as brought under our notice by these cases.

The first is this: that the eczema of books and the eczema of practice are not always identical.

In my experience the purely typical disease is not so often met with as the complicated. I here take the term complication in its widest sense, as not only comprising the complication of eczema with other distinct cutaneous diseases, but also, and chiefly, the complication of the typical form with one or more of its known varieties.

In the first of the cases just detailed, there was not *prima facie* any complication; but had we seen it earlier, we probably should have noticed the typical form which passed away with the acute inflammatory stage, on one part of the scalp, and the disease as it appeared on the 24th of March, 1864, on other parts.

In the second case it was clearly complicated in the sense above given. On reference to several cases recorded by me in the *Dublin Quarterly Journal* during the past year, I find in the February number (page 252) a case of scabies with eczema, and a case of eczema impetiginodes. Again, in the May number (page 495), another instance of the same kind; and also one of syphilitic eczema, which, however, we shall not now discuss, as it should be properly ranked among the "syphilides." Further, in the August number (page 254), a very remarkable case, to which I have particularly referred in my edition of "Neligan on the Skin" (page 105). Here the patient had, at the same time—1, on the right arm, a typical eczematous eruption (vesicular); 2, on the left arm an impetiginous eruption; 3, on the left cheek an erythematous blush. In a fortnight after, the diseased skin of the left arm became "rimous"—the eczema fendillé of Hardy and the French school.

I may further observe, in connexion with this subject, that greasy applications are not favourites of mine in eczematous cases. I find that they rarely do good. The local treatment which I mostly adopt is such as I have already described; where itching is troublesome, stuping with infusion or decoction of bran is of great service, and mucilage of starch, applied night and morning, in almost every case "mops up" the weeping, and fits the case for the local application of iodine. In inveterate cases, where the skin is in the scaly stage, and where there is no infiltration, I repeatedly have used Hebra's tincture, or tinctura saponis viridis cum pice, with good effect, and I can confidently recommend it. Its composition and mode of application I quote from my edition of Neligan, p. 114:—"This consists of equal parts of tar, soft soap, and methylated spirit. It should be applied twice daily, suffered to dry on the skin, and washed off with soft soap or petroleum soap;" the only kinds, I may add, which ought to be used in this disease. This preparation, as its name denotes, was invented by Professor Hebra, of Vienna, and was recommended to me by Dr. McCall Anderson, of Glasgow, about two years ago.

But it is on the constitutional treatment that I place most reliance in cases of eczema. Iodide of potassium is good, but arsenic is much better; and I never met a case yet that stayed with me long enough and was not cured.

It will take months—from three to nine, I find—to effect a cure, but it can be done, and only by combined perseverance on the part of both patient and physician. Most of the cases I have met with have been with Dr. This and Dr. That; but, with scarcely an exception, none of the many doctors has had fair play from the patients. The patient generally gets dissatisfied when not cured at once, especially when the disease gets aggravated, as it almost always does immediately preceding the amelioration caused by continuous arsenical treatment.

Another capital error is not to continue the constitutional treatment for some months after apparent cure. This is instanced in the second case given in this paper. The patient reappears in eight months with the disease in a mild form. It should be remembered that medicines and local applications which suit one case will often prove useless in another, which to all appearance may be similar.—*Medical Press and Circular, April* 18, 1866. *p.* 391.

51.—THE CURE OF ITCH.

Let the affected parts be well washed with a strong warm solution of common soda, and, after being dried, then apply very freely paraffine; and a few repetitions will accomplish all you need. The plan is cheap as well as simple, and now paraffine is to be found in almost every cottage.—*British Medical Journal, Sept.* 1, 1866, *p.* 271.

52.—ON INFLAMMATION AND ABSCESS.

By F. C. Skey, Esq., F. R. S., Casualty Surgeon to St. Bartholomew's Hospital.

It is a prevailing error among the unthinking members of our profession which refers all examples of redness of vessels to inflammation. No term can be more inappropriate. The ancient definition of inflammation is founded on truth, and will hold true to the end of time: but it is rendered absurd by the practice of the modern school. In the too frequent employment of the name we forget the conditions essential to it. The arterial and capillary systems perform their healthy functions so long only as they retain the normal influence of the nerves supplying them, whether locally or generally. If the supply of nervous influence fails, the capillary system of a part loses its healthy tone, and the vessels locally dilate. At the same time they lose the power of propulsion, and there arises of necessity a local remora or arrest of the circulation, and, as a matter of course, the part becomes red. Is this inflammation? Yes, in the judgment of many, it is termed a form or variety of inflammation, not strict or positive, but inflammation of an asthenic type, although it fails in three of the four conditions essential to true inflammation, and exhibits redness only, wanting pain, heat, and swelling.

Now these examples of local congestion or plethora of vessels are yet in the present day confounded with true inflammation, and are treated by what we term antiphlogistic agents—viz., general and local bleeding, purgatives, diaphoretics, and the suspension of food. True inflammation is not so commonly seen as you may imagine; and inasmuch as local redness does not involve all the required signs of heat, redness, pain, and swelling which that state requires, it cannot be true inflammation, and there is no difficulty in proving that the treatment usually adopted in true inflammatory diseases is especially objectionable and injurious in this. There is another variety of so-called inflammation, in the mouths of a large number of us called chronic; what it means is somewhat difficult to define, but we employ it rather to conceal a difficulty than to expound it. There are two principles on which this congested condition of the blood-vessels may be treated.

1. Blood may be taken locally; the system may be lowered by salines, as they are termed, by purgatives and diaphoretics. This treatment by local depletion would lead to the inference that the blood is at fault and should be removed.

2. The blood in these vessels may be forced onwards by giving increased action to the heart, by the resort to agents that tend to restore the healthy tonic condition, or, at all events, to give force to the capillary system of the affected part. This latter is termed the tonic treatment of disease—a principle, I consider, based on a sound view of the functions of the animal economy, and which formed the staple of my treatment during the period in which I was attached to this hospital as surgeon, and for many years prior. If this principle be sound, treatment by depletion in any form must be an error, and therefore injurious, and that it is injurious I have not a doubt. I can speak with some confidence, for I have tried both. In the history of the human mind there is no operation more difficult than that of divesting it of early impressions inculcated by authority and confirmed and established by time. Convictions increase in strength as we get older, for the habit of examining the one side of a question only, and of conforming to all its requirements, has assumed a settled permanent form, and with the multitude

engaged in the practice of our profession there is no adequate motive to enter on a path of inquiry which may tend to unsettle the convictions of their past lives. Some fifteen years since I had a succession of cases of severe congestion—that is, redness, not inflammation—accompanying wounds caused by operations, cases of mammary cancer or other tumours removed by the knife, amputations, hernia, &c. These cases exhibited on the third or fourth day congestion of the vessels around the wound, which often extended and led to abscesses, and occasionally to death. It was called erysipelas, having the feature of redness only in common with that disease; but it was not erysipelas: in truth, it was a far more formidable condition. I ordered every patient, after undergoing any serious operation, treatment by stimulants. I gave two tablespoonsful of brandy and two of water every four hours, to be continued for one, two, or more days. From that date I never lost a patient from this cause, and rarely did any unhealthy condition of the affected region present itself.

Now observe this feature in the treatment by stimulants. If these examples of local congestion of the blood-vessels partook of the nature of inflammation, you, I am sure, will concur with me in considering this treatment a blunder. If stimulants be inadmissible in the treatment of inflammation, the treatment should have proved injurious. This it did not do, but, on the contrary, effected early and curative results; therefore the disease was not that of inflammation. What is true of the local, is equally true of the general.

The late Mr. Jones, of Jersey, was a remarkably successful operator, and in reference to his cases of operation for the excision of joints (considered to be diseased) he operated on a succession of more than twenty-five without the loss of a single case, while in England, at the same date, the mortality was always great, recovery being rather the exception, and not the rule. What was the secret of this? Was it fresher air, or different management? I made the inquiry, and learnt that Mr. Jones invariably gave every patient on whom he operated, at least a pint of port wine on each of the two days following the operation, and he acknowledged to me that he owed the treatment which had been attended with such remarkable results to his observation of the success that had attended my treatment in St. Bartholomew's Hospital. I have found this combined tonic and stimulating treatment eminently successful, and so convinced am I of its value that, if I were told it had been less successful in the hands of others, I should feel assured it had never been fairly tried. In no disease is the application of this principle more valuable than in every variety of abscess, whether chronic or acute, and especially, perhaps, the latter.

This treatment is essentially tonic in its character. Its object, as I have above stated, is the employment of such medicinal and dietetic agents as tend to restore the constitution to a condition of health and vigour. This is all we can pretend to do, and, rely upon it, nature will do the rest. I do not say exclude all local treatment. Doubtless a few leeches may relieve the pain, and fomentations or poultices may in some slight degree contribute to the same end; but these agents are not, critically speaking, curative—they palliate symptoms only—and as pain is an evil, and itself, when severe, a source of prostration, the surgeon may justly combat it by such remedies as do not draw on the circulation and thus reduce the vital powers of the body.

There are two agents, in addition to good nourishment, especially applicable to the treatment of a case of this kind—bark and wine. There is an inferior class of remedies, but of the same character, such as bitter infusions —cascarilla, gentian, and the like, and the varieties of infusions of malt. There is no comparison between the virtues of the two classes, but as poor persons cannot afford wine, they may afford good beer, of which the strongest is the most efficient; but among medicaments cinchona bark has no rival. In all cases of abscess, bark is invaluable. It promotes suppuration when suppuration is inevitable, and it checks suppuration in the exhausting action of chronic abscess. It promotes appetite, and gives vigour to the system beyond any other known tonic, and it is only on this principle that it carries

our patients rapidly through the different stages of disease. I prefer the simple tincture of bark, and I recommend you to administer it in full doses of from one to three drachms twice a day. For adults I generally recommend a dessert-spoonful, and not less, and I have not observed that its employment in such doses demands the corrective influence of either purgative or alterative medicine; but on the contrary, as I refer any temporary torpidity of the actions of the alimentary canal to the want of that vigour of system, and to that only, which the bark is capable of correcting, so as a rule, subject of course to occasional exceptions, I leave the bowels alone. I have a very limited faith in the cathartic system. In this I know I am un-English; but I am content to live under the obloquy. On the subject of wine I have no intention of entering on the question how far alcohol is a source of strength or of nutrition. As an ingredient in the diet scale of the invalid it is indispensable; and there is a very important rule of conduct as regards its administration, the knowledge of which I am most anxious to impress on your minds, and which involves a principle that cannot fail to obtain your concurrence on a closer observation of the nature of disease and the remedies pertinent to it. The prominent rule I allude to is this:—Administer wine or alcohol in quantity regulated by its effects on the system, and not in any fixed quantity determined by usage. A gentleman with a weak pulse is told by his physician to take wine freely, and he indulges in a bottle of claret at and after dinner, and by so doing he considers himself to have obeyed the injunction of his medical adviser. Now, I shall select port wine as the standard by which I regulate the advice I give under the above circumstances; and I am of opinion that for the purposes of health three glasses of wine is the maximum quantity that, taken at any one time, can be serviceable. All beyond this answers the purpose of luxury and nothing more, and is more or less injurious. Suppose a person of abstemious habits takes a glass of wine, being much fatigued from exercise, how long will he continue to feel the benefit of it? Possibly, at the outside, two hours or less. The wine did good service at the time; but the effect has passed entirely away. If this person be subject to a renewal of the fatigue, he can take a second glass at the expiration of two hours on the same conditions, and so on. He has in his fatigue the equivalent to disease, and he takes the restorative—with this result, that, having consumed five or six glasses of wine, he is not conscious, judging from his sensations, that he has taken any. If this law be founded in truth, I say administer wine frequently in moderate quantities, or in immoderate quantities if they are required. You can judge for your patient what quantity he can take and what he requires, and I say, unhesitatingly, when required, the more he takes the better and the sooner he will be well, which I presume is the object to be attained. Judge the quantity of wine then required by its effects, and do not administer it in given quantities. I consider wine indispensable in the tonic treatment of disease. It should be administered in moderate quantities at short intervals. If too short, the effect of the wine will prove cumulative, and reaction will follow. The art of administering alcohol, whether in the form of wine or brandy, is learnt by observation of its effects on each individual; and be assured of this, that the quantity consumed with impunity, be it large or small, is the gauge of its want by the system of that person.

During the last forty years, the treatment of disease has undergone great and important changes, and up to a later date the use of wine has been very exceptional. I do not overstate the case when I affirm that within the period I have mentioned the consumption of wine and brandy in the London Hospitals has increased fourfold; and I may here relate an anecdote which confirms the above statement. It has, I believe, been before published, but I deem it right to bring it again under your notice. In the year 1848 the treasurer of the hospital commented on the quantity of wine I ordered for my patients. He said the hospital could not warrant the large expense. I inquired the number of patients—550; and the wine consumed was three pipes per annum. I told the worthy treasurer that the consumption of wine quite surprised me; that I could not understand how my colleagues could manage their

cases, for that I could not treat hospital cases without wine; and I assured the treasurer that I would do my best, for the credit of the hospital, to raise the consumption of port wine from three pipes a year up to thirteen, and that nothing less would satisfy me or my convictions. Twelve years elapsed, when I was again addressed by the successor of the then treasurer on some matters connected with the diet scale of the hospital. On inquiry into the consumption of port wine, he appealed to the apothecary, who, referring to his wine book, announced the quantity annually consumed to be thirteen pipes! I was on the previous occasion the great delinquent, but now, as the treasurer declared, "You are all nearly equally bad, although *you* still head the list." And the same change in the treatment prevails more or less in every hospital in London. Although this employment of stimulants and tonics at the expense of depletive agents has become so prominent a feature in modern practice, it does not appear to have exercised much influence on the theory of disease as taught in the schools, nor on the practice of the profession among the community.—*Medical Times and Gazette, July 7*, 1866, *p.* 1.

53.—DILUTION OF VACCINE LYMPH WITH GLYCERINE.

By Dr. Muller.

Geh. Medicinalrath Muller, director of the Berlin Vaccine Institution, has just published a communication concerning vaccine lymph which he regards as of considerable importance. After adverting to the well-known difficulty of obtaining vaccine lymph in sufficient quantity, especially when large numbers have to be speedily vaccinated or re-vaccinated during the prevalence of epidemic small-pox, he observes that it is, therefore, a matter of great importance to be in the possession of a means by which every practitioner may preserve for himself an ample store of this precious substance. Such a means is to be found in mixing the vaccine virus with diluted glycerine. Without in anywise interfering with its efficacy, this increases its quantity and its power of keeping. Finding that the vaccine scab is best dissolved in glycerine, and impelled to seek for some adjuvatory means by the numerous applications he received from every province of Prussia, as well as from foreign parts, the author was induced to try the effect of some lymph which he had mixed with diluted glycerine, and the results were in the highest degree encouraging. While augmenting the vaccine material ten or twenty fold, the pustules which resulted, neither in their course, appearance, the amount of lymph they contained, or the reaction they gave rise to differed in any degree from the pustules produced by the purest lymph. The proportion cannot be exactly determined, because the quantity taken up by the pencil cannot be weighed or measured; but as an example it may be stated that lymph from three pustules, having been mixed with diluted glycerine, served not only to vaccinate several children, but to charge about forty capillary tubes. Lymph which has been preserved in tubes can be similarly treated with the glycerine, but it will be best only to employ that which has been kept in them for a few days or weeks. How far the dilution of the lymph can be carried without damaging its efficacy is being tried. At present the results have been found uncertain when diluted more than twenty times. Diluted only ten times, they are always certain.

If these statements are admitted, as they must be, it results that the practitioner may always be in possession of a sufficient supply of reliable lymph, which may easily be stored up, seeing that the lymph enters the tubes with greater facility than in its undiluted state, and keeps much better. With the lymph derived from a single child, a whole battalion of recruits may be re-vaccinated. The vaccinator may, too, (not so pressed for lymph as heretofore,) exercise more caution in selecting the subjects for supplying it. On account of its greater preservability, this mixed lymph will also far better bear transmission to distant countries and tropical climates than does the ordinary free lymph. The great ease with which the tubes are filled without

contact with the air, and then sealed, will much aid the employment of this diluted lymph. Dr. Muller's exact mode of procedure is as follows:—Having opened some of the pustules of a child vaccinated eight days before, he collects the lymph which issues out upon a small, new hair pencil. The pencil is then moistened upon a glass or porcelain plate by means of from ten to twenty drops of chemically pure glycerine, diluted with equal parts of water—the whole being most thoroughly mixed together by means of the pencil. With this mixture vaccination is immediately performed, or capillary tubes are filled with it and sealed for future use.—*Medical Times and Gazette. May* 19, 1866, *p.* 526.

54.—CASE OF CANCER OF VERY LARGE SIZE OCCUPYING THE SIDE OF THE FACE AND NECK—TREATMENT BY INJECTIONS OF ACETIC ACID.

(Under the care of Dr. BROADBENT and Dr. RANDALL.)

The following case illustrates chiefly the destructive effects of acetic acid injections on malignant tumours of large size and rapid growth; but it is not without instructive suggestions on other points, such as the limitation of the action of the acid to the cancerous structure.

In a case of this kind absorption was not to be looked for, and necrosis was the result expected. The amount of destruction, however, which followed the first injection astonished all who were watching the case. Equally remarkable was the slight amount of suffering attending the process. The absence of fœtor noted is characteristic of this process of treatment. One of the dangers to be anticipated in a tumour of this size in this situation is hemorrhage, but the acid seems to spare the vessels; and as these at first exposed in the neck are now hidden by granulations, there is much less ground for apprehension on this score. As to the future prospects of the patient, the tumour is now limited to the face, in the bones of which it apparently took its rise, and it will be difficult to eradicate the disease at this part, especially as the acid cannot be retained in the morbid structure in any considerable quantity. Further destruction of skin would be undesirable, and to avoid this the later injections have all been made from the wound, which facilitates the escape of the fluid. Up to the present, the treatment is gaining considerably on the disease, and while this is the case, the present cautious mode of proceeding will be persevered in; but, if necessary, more energetic measures can be taken. On the whole, it seems probable that the old woman's life will be prolonged by the treatment, and that it will diminish her aggregate of suffering. The further progress of the case will be reported in some future number.

The patient, an old woman aged 73, had been for some time in the Marylebone Workhouse. The tumour had been growing twelve or eighteen months, and as it had attained a size which might very fairly be characterised as enormous, its rate of increase must have been very rapid. It occupied the right side of the face and neck, the centre appearing to be about over the angle of the jaw. The skin was red and tense, and the tumour was elastic to the feel, but firm. It had occasioned no great suffering for some time at first, but had recently become the seat of some pain, and it interfered with mastication and deglutition. The larynx was pushed aside, and the facial nerve having been destroyed in the progress of the disease, the mouth was drawn to the left, increasing the deformity.

Dr. Randall and Dr. Broadbent decided on the acetic acid treatment, although it was very doubtful whether the patient would have strength to endure the removal of so large a mass, supposing this to be possible. There was reason to hope, however, that the process would be attended with little or no suffering, and it seemed to offer some slight chance of relief in a case otherwise entirely hopeless.

On October 3, therefore, about 40 minims of acid of the strength of one part in four, making 80 minims in all, were injected at two points. The opera-

tion gave no pain. Some glutinous colloid matter exuded from the punctures, which matter on examination was found to contain small cells, some of them bi-nucleated, and minute highly refracting particles, scattered and in groups.

For two or three days afterwards there was increase of tension in the tumour, and greater difficulty of deglutition, so that fluids only could be swallowed. A little discharge made its way into the mouth, and the skin then gave way, a large quantity of matter escaping.

Oct. 9. A large opening existed, which was occupied by a loose grey slough; the tumour had diminished very considerably—more than one-half—and the remains occupied only the face, where numerous hard nodules could be felt. The patient could swallow comfortably. She had suffered very little pain, and her strength was apparently not at all diminished. A noteworthy feature in the case was the entire absence of fœtor from the wound or discharge. Two injections of 40 minims each were made into distinct nodules. No pain. A poultice containing acid applied.

16th. Slough entirely separated from lower part of wound, which is now perfectly clean and healthy-looking. The muscles are laid bare, and the carotid is seen pulsating at the bottom of the cavity. At the upper part of the wound the angle of the jaw is readily made out, covered by a grey soft material. The nodules last injected had disappeared. Patient cheerful and comfortable, swallowing and eating better. No injection till it is seen how the carotid and its branches behave.

19th. Lower part of wound granulating, and opening contracting rapidly. Upper part as before. A little acid was injected into the soft matter covering the angle of the jaw, but this it readily ploughed up and escaped. Injections were practised into remains of the tumour upwards towards the malar bone and downwards over the body of the jaw; the latter only was well retained. The diseased parts to be sponged with the dilute acid.

23rd. The granulations in the lower part of the wound progressing rapidly, and the opening in the skin contracting. A considerable mass of disease still left over the superior and inferior maxillary and malar bones. The sponging with acid seemed to have been of use. A large cavity exists where the successful injection was made on the 16th. Acid injected in various directions from the wound, but little was retained. The patient is cheerful and comfortable, and, on the liberal diet allowed her, gains strength.—*Medical Times and Gazette, Oct.* 27, 1866, *p.* 445.

DISEASES OF THE EYE.

55.—ON REMOVAL OF THE LACRYMAL GLAND AS A RADICAL CURE FOR LACRYMAL DISEASE.

By J. Z. Laurence, Esq., Ophthalmic Surgeon to St. Bartholomew's Hospital, Chatham, and to the Ophthalmic Hospital, Southwark.

[It is within quite a recent period that Mr. Bowman's dilating system succeeded the old style, which some eminent surgeons still regard as the best means of cure in cases of obstruction of the nasal duct. In the majority of cases, however, Mr. Bowman's plan proves difficult in its application, and unsatisfactory in its results, and one cannot but be struck with the number of cases which have lasted and been treated for years without the slightest prospect of anything approaching a permanent cure. When in Italy in 1865 Mr. Laurence saw several cases which had been treated by Nannoni's method of destruction of the lacrymal sac, and with very satisfactory results. The operation was also practised twenty years ago by Dr. P. Bernard, but since that time it has never been systematically pursued.]

In the December of last year, a man, æt. 25, applied to me at the Ophthalmic Hospital, Southwark, on account of an inveterate watering of the left eye from obliteration of the lacrymal canaliculi—the results of a burn by caustic soda some three years previously. No trace of either punctum lacrymale could be seen, and the inner part of the eye-ball was partially adherent to

the lacrymal caruncle by old bands of adhesion. I attempted to restore the perviability of the canaliculi by Jüngken's operation; but failing in doing so, I resolved to perform the only other operation that appeared to me to offer any chances of success—namely, removal of the lacrymal gland. I found this operation perfectly easy. Within four days after the operation, the watering of the eye had ceased; nor was the eye unduly dry. On Sept. 25th, 1866, about nine months after the operation, I saw the patient again, and was able to verify the permanence of the relief up to that period.

The facility and success of my operation stimulated me to inquire how far it was applicable to cases of inveterate lacrymation generally. This inquiry is at present on but a limited scale; its results are, however, so satisfactory, that I have ventured to submit them to the profession.

Emma N., a child about three years old, was brought to me at the Ophthalmic Hospital, Southwark, for watering of both eyes, and lacrymal abscesses of about a year's standing. I, in the first instance, tried to dilate the nasal ducts with probes, after Mr. Bowman's method; but found, partially no doubt on account of the child's intractability, the method quite inapplicable.

I then attempted to obliterate the left sac by Nannoni's method, with the solid perchloride of iron, but met with no better success.

On March 6th, 1866, the left eye was continually watering, and pressure over the lacrymal sac caused a slight amount of pus to exude from a lacrymal fistula, and a very large amount from the puncta lacrymalia. I removed the lacrymal gland, and within a week from the operation all watering of the eye had ceased.

On March 16th, I removed the other lacrymal gland for a nearly corresponding condition of the right eye; within a week the watering of the right eye had ceased. I saw the child many times after the operation. On the 25th of September, not a trace of lacrymation remained; the lacrymal fistulæ are quite healed. A little pus can be pressed out of the puncta of either side by pressure over the lacrymal sacs. Both eyeballs had ever since the operations continued perfectly moist and normal in all respects. A curious, but natural, sequence of this operation was observed in this case very markedly, namely, the complete inability to shed tears. This child always set to crying most lustily whenever the mother brought her to me, but never shed a single tear, however much she shrieked and cried. For a little while immediately after the operation, this patient suffered from a slight degree of ptosis, but this gradually entirely disappeared.

[A summary of the main features of six other cases is then given; after which the author continues:]

I have removed nine lacrymal glands in eight cases. In these cases the following results of the operation deserve some notice. The disappearance of the watering of the eye was immediate and permanent, as far as my observations extend. A remarkable feature in this point of view was, that this ensued whether the gland was completely or only partially removed. Indeed, in one case, which I have not recorded, that of an infant, I could not succeed in removing the gland; but curiously enough, although the eye had previously watered since birth, within eleven days after my aborted operation, all lacrymal symptoms had ceased, and when the child was last seen, forty-nine days after the operation, the cure had remained permanent. These facts suggest the idea whether a simple division of the ducts of the gland might not suffice for the cure of these cases? Some such idea occurred also to Szokalski, when he proposed to ligature the ducts of the lacrymal gland, and thus induce its atrophy.

The first question every one who has heard of my operations has asked me, has been, does the eye continue moist after the operation? It does, completely so. My experience in this point of view is corroborated by that of Mackenzie and of others, who have removed the lacrymal gland on account of tumours of its substance. Thus Mackenzie states, "the moisture and lubricity of the conjunctiva remain unaffected after extirpation of the lacrymal gland." In Dr. O'Beirne's case, in which the lacrymal gland was removed on account of its enlargement and induration, the patient suffered no incon-

venience. Nor did Mr. Dixon's patient, who underwent the operation on account of traumatic obliteration of the canaliculi.

Another remarkable consequence of removal of the lacrymal gland for abscess of the sac is, that the abscess and discharge of pus through the puncta gradually cease. This I regard as analogous to the cessation of cystitis following dilatation of stricture of the urethra. The sac is no longer irritated by over distention by the tears, which, also, doubtless, acquire acrid properties from their undue retention, and thus the lacrymal cystitis gradually ceases.

In most of my operations, which have been performed by the external operation, a slight degree of ptosis has followed the operation, but gradually disappeared. This ptosis is due to two causes:—firstly, a partial division of the levator palpebræ; and, secondly, œdema of the upper eyelid.

I consider removal of the lacrymal gland applicable to those cases of inveterate lacrymal fistula, which other methods, after a fair trial, have failed to cure, the operation offering the best prospect of a radical and permanent cure.

Some of the cases I have narrated might, doubtless, have been cured by other means. But my object has been to reopen a field of experimental inquiry to solve the question—Will removal of the lacrymal gland cure lacrymal abscess? Bernard's and my own cases prove that it will. I intend prosecuting this inquiry in all fit cases that occur to me. For what class of cases the operation is specially applicable, is another question which subsequent research must determine.

The method that I have followed in performing the operation has been to make a transverse incision of about ¾ in. into the orbit, below the upper and outer third of the orbital ridge. After a little careful dissection, the gland may be found in the wound by the little finger, laid hold of by a small sharp double hook, brought forwards into view and removed. With one exception, the wound in my cases healed by the first intention. The linear scar of the incision is inappreciable, being lost in the folds of the upper eyelid.

From some operations I performed on the dead subject, I thought that the gland might be more easily removed by an incision from the inside through the conjunctiva of the upper palpebral sinus. On attempting to put this plan into practice, I found that the readiest mode of exposing the gland was by a combination of the internal and external incisions. After making the external incision, I divide the external commissure of the lids with scissors, and, by connecting the outer ends of the two incisions, form a triangular flap, which I throw up. In this way the lacrymal gland is easily exposed. I have never had any troublesome hemorrhage. An artery of the orbit (probably the lacrymal branch of the ophthalmic) bleeds the most freely; but this has, in my cases, soon stopped on the application of cold water. The difficulty of finding the gland varied in the cases I have operated on according to the depth it lay at, and the amount of fat in the orbit.—*Ophthalmic Review, Oct.* 1866, *p.* 138.

56.—ON RHEUMATIC IRITIS.

By James Rouse, Esq., Lecturer on Anatomy at St. George's Hospital School.

[By rheumatic iritis is meant that form of inflammation produced by sudden changes in the atmosphere, whether thermometric, from hot to cold, or hydrometric, from dry to moist. In these cases there may be presumed to be an acid state of blood, manifesting itself by inflammation and effusion into the joints, by acid secretions from the skin and kidneys.]

The diagnosis of rheumatic iritis is not a difficult one: the history of the case and the appearance of the patient are the main indications. Much has been said by authors about the danger of confounding iritis with rheumatic or catarrho-rheumatic ophthalmia, with corneitis, with retinitis, &c.; but it appears to me that very slight knowledge of the subject will enable a surgeon to steer clear of this danger. I must, however, admit that the

diagnosis from certain cases of syphilitic and strumous iritis presents some difficulty; as, in the former, patients will often resolutely deny the occurrence of primary disease, unless an eruption remains, which will settle the question. It may be asked, Can you distinguish between rheumatic and syphilitic iritis by the appearance of the eye alone? Only in certain cases, I believe, where the iritis is chronic and the ophthalmoscope can be used, this instrument displaying syphilitic deposit on the retina. German authors state and believe that in syphilitic iritis the pupil is always displaced upwards and inwards. In order to test the value of this statement, I carefully recorded a number of cases of syphilitic iritis; and I find that the iris is less frequently displaced upwards and inwards than in any other direction; clearly, then, we cannot depend on the displaced pupil as a means of distinguishing between these two varieties of the disease. There is in the syphilitic affection less conjunctival inflammation, less intolerance of light, and a greater tendency to deposit of larger masses of lymph on the anterior surface of the iris, also a greater tendency on the part of these masses, when formed, to degenerate into pus. In strumous iritis the diagnosis is easier, as this disease is always the sequel of other strumous affections of the eye.

The prognosis in slight cases is most favourable, as the eye usually entirely recovers the effects of the inflammation; but when the patient has been neglected, and the iris has become completely adherent to the capsule of the lens, a very cautious opinion should be given; for although in some instances all the effused lymph has been absorbed under the use of mercury, the more common result is lasting damage to the eye.

Of all the sequelæ of iritis none are more common than permanent adhesion of the pupil to the capsule of the lens. This adhesion may be (1) total, the posterior chamber no longer communicating with the anterior, ; or (2) partial, little delicate bands passing from the pupillary margin to the capsule of the lens. Besides the pupil being changed in form and rendered immovable, lymph may be deposited on the capsule, giving rise to what is called cataracta lymphatica, or spurious cataract. Now, these adhesions, whether total or partial, give rise to one of the most troublesome complications the oculist is ever called upon to treat—to wit, recurrent iritis. Fortunately we are now able to prevent, by an operation, the destruction of vision which would sooner or later occur from this complication. There is another and equally serious affection which not unfrequently is a sequela of rheumatic iritis, viz., irido-choroiditis. The symptoms indicative of this disease are, in addition to those of iritis, increase of nocturnal pain, sparks or rings of light continually passing across the sight, gradual and constantly increasing intra-ocular pressure, then glaucomatous hardness of the eyeball, and, if this be not relieved, destruction of vision.

Before entering into the question of what remedies we are to make use of, we must remember that the chief objects we aim at are, 1, to subdue inflammation; 2, to prevent effusion, or, if effusion has already taken place, to prevent its organisation; 3, to preserve the pupil, and relieve the severe pain which usually exists. In the treatment of iritis, there is no remedy, if given judiciously, that produces so great an effect in subduing inflammation, and in preventing the effusion of lymph, as mercury. I find two grains of calomel, and a quarter to half a grain of opium, the best and most convenient form of administration; but it must be always borne in mind that salivation is not the effect required, and, except in the slightest degree, it is rather to be avoided than promoted. The favourable result of this treatment mainly depends upon its being commenced early in the disease.

Unfortunately patients seldom apply for advice early; consequently we are called on to treat cases where lymph is not only effused, but is becoming slowly consolidated, and yields but slowly to treatment. In these cases mercury has to be given for a long period,* and the gums kept just spongy. If this be done, the lymph, in a great measure, becomes absorbed, at worst

* In these cases I give the following prescription: ℞. Pot. iodidi, gr. x.; liq. hydrarg. bichlor., ʒj.; decoct. cinchonæ ℥j.; ter quotidie.

a few tags only become organised, and a good recovery is made. There are, however, many cases in which large doses of mercury should be avoided, and the drug administered only in very small quantities—to wit, in persons of broken-down health or of phthisical tendencies. Under these circumstances I find a combination of two grains of quinine, three of blue-pill, and three of extract of hyoscyamus, most beneficial. I have had recently under my care a young strumous patient afflicted with rheumatic iritis, in whom a perfect recovery, without apparent damage to his general health, has taken place under such treatment. A very important question arises in relation to the period when mercury may be discontinued with safety. I hold a very strong opinion myself, that it should be persevered with so long as the sclerotic zone of vessels is visible; for, so long as this symptom continues, a relapse may take place.

We must now pass to the consideration of the use of belladonna in these cases. Most authors recommend its use in every case, and in all stages of the disease. Gräfe says: "the severity of the pain is by no means a contra-indication for this treatment; for the most severe ciliary neurosis often diminishes when the pupil dilates." "It should be applied daily, six, eight, or ten times, or oftener, at intervals of five minutes; and notwithstanding the irritation, both the pain and the other symptoms are generally alleviated.' In very acute cases Gräfe applies atropine twenty or thirty times a day. Contrast this with the opinion of Mr. Dixon, one of the soundest practitioners in this country. "I do not regard it (atropine) as of any service in iritis; for, as I stated, an inflamed iris loses its power of motion. Atropine, therefore, must be useless during the active stage of inflammation. At a later period, when the iris is beginning to recover its motory function, it may, I think, even do harm; and in the following way: the hinder surface of the iris, termed uvea, is covered with a layer of pigment-cells; when fibrine is poured out behind the iris, these pigment-cells become for a time firmly united to the capsule of the lens; and if, when the iris is regaining its motory function, a forced dilatation of the pupil be effected by the influence of atropine, some of the pigment may be detached from the posterior surface of the iris and left adhering to the capsule, forming those brown patches so familiar to us in patients who have suffered from iritis."

I have quoted at some length these opinions, as showing how two men, both of vast experience, may differ on a point of treatment apparently so easy of decision. During the last seven or eight years I have had a very large number of these cases under my care; and I have adopted the following plan, which appears to me to answer very well. In the early stage of the disease—that is, before the lymph is consolidated—a solution of sulphate of atropine, four grains to the ounce, is used every night and morning. When the attack becomes very acute, it is discontinued, because I have found (as Mr. Dixon states) the adhesions ruptured, and the pigment left behind on the capsule of the lens. When the lymph is being absorbed I again use the solution, as it dilates the pupil and stretches the bands attached to the margin of the iris. These at last give way; and as they are nourished by the iris (as shown by Gräfe), become atrophied when detached from it.

From these remarks on belladonna, it will be perceived that I do not believe in its curative effect, but that I consider it only as a useful auxiliary to other remedies.—*St. George's Hospital Reports, Vol. I.*, 1866, *p.* 105.

SYPHILITIC AFFECTIONS.

57.—A NEW REMEDY IN GONORRHŒA.

By Dr. J. S. Prettyman, Milford, Del., U. S.

[The oil of erigeron was first used by Dr. Prettyman in hæmoptysis, and it was from this that its use in gonorrhœa suggested itself to him. He finds it to act "with unvarying success." It is a volatile oil obtained from the *Erigeron Canadense*, and has also been found of use in diarrhœa and various

hemorrhages. There are three species of erigeron, or fleabane, officinal in the United States Pharmacopœia, and they are used in the forms of infusion, powder, and watery extract. Speaking of the oil of erigeron the author observes:]

It arrests the discharge in about 72 hours, and effects a cure in from six to eight days. I do not recommend it as a specific in all cases, but design merely to bring it to the notice of the profession as an exceedingly valuable medicine in this disease. Of course all scientific medical practice is based upon the well-known pathological condition of the structures involved, and this is our unerring guide. When, in recent cases, the urethral inflammation is severe, my plan is to precede the remedy with a full dose of some active hydragogue. A good formula is:—℞. Pulv. senna, ʒ ij; pulv. jalapa, ʒ j; pulv. aromaticus, gr. x. M. Add a gill of boiling water and a teaspoonful of sugar, and when sufficiently cool, agitate, and swallow at a dose. As soon as this operates, give ten drops of the oil on sugar, and three hours later a full dose of spts. æther. nit. in infus. althea, and so on every three hours alternately until the urethral irritation is allayed. Then leave off the latter, and continue the oil until the cure is complete. If the case is not recent, or there is but little urethral irritation, the oil alone is sufficient.

I have used it also in combination with copaiba and other articles, and found such preparations to answer a good purpose, but no better than the oil alone.

The oil which I use is reputed to be that of the *Erigeron Canadense;* but I presume that from the *Philadelphicum* is equal, if not superior, for this purpose.—*American Medical Journal, July*, 1866, *p.* 117.

58.—ON THE OIL OF YELLOW SANDAL WOOD IN THE TREATMENT OF GONORRHŒA.

By Dr. H. Samuel Purdon, Physician to the Belfast Dispensary for Diseases of the Skin and Chest, &c.

Having for some time used the oil of yellow sandal wood in the treatment of gonorrhœa, I take the liberty of laying the following observations before the profession.

We are indebted to Dr. Thomas Henderson, of Glasgow, for introducing to our notice during the summer of last year this oil, at present used extensively as a perfume. This oil is obtained by distillation from the wood of the tree *Sirium myrtifolium*, a native of the East Indies, "one pound of the wood yielding about two drachms of oil." The dose being ten to thirty drops diluted with rectified spirit, but as it is liable to sicken when thus administered, I now combine it with various other remedies as hereafter mentioned.

I have now tried this remedy rather extensively in private practice, as its price renders it too expensive for either hospital or dispensary use. The following facts differ slightly from Dr. Henderson's conclusions:

"Dr. Henderson states that the oil of yellow sandal wood acts as a stomachic medicine, occasioning little nausea."	In many cases I have had to discontinue its use, on account of the nausea it occasioned.
"Has slightly any smell."	The odour of this oil is extremely powerful, remaining on the breath, hands, &c., even after being frequently washed. It is also evident in the urine, and in one case I remarked a sickening odour emanating from the penis, and which was very annoying to the patient.

The above are the only objections I know of, and when we take into consideration the rapidity with which it cures, as contrasted with either cubebs or copaiba, it may be looked on in the light of a specific, but I think it right

to mention that I know of two cases when its use certainly aggravated the disease. This oil of yellow sandal wood may be used in any stage of gonorrhœa, and the following are the formulæ that I usually employ.

℞. Olei santal. flav., 3iij.; ess. cinnamomi, 3j.; spt. rect. ad ℥ij. M.

Sig. "A teaspoonful three times a day in a wineglassful of water, after food."

In some cases the compound spirit of lavender occasions the oil to agree better with the patient. Bearing in mind the maxim that "union is strength," it occurred to me that by adding oil of savin, copaiba, &c., a mixture might be obtained, which would without doubt be a "specific," and the following I have often used with the best results.

℞. Olei santal. flav., ℥j.; olei sabinæ, 3j; olei cubebæ, ℥ss.; olei copaibæ, ℥j.; ess. cinnamomi, 3j.; spt. rect. ad ℥vj. M. Dose the same as the preceding.

This is a very powerful mixture and usually cures in a few days. In cases where copaiba has failed, the oil of yellow sandal wood frequently acts "like a charm," and I very seldom use injections in any case of gonorrhœa. This oil is also useful in gleet, and we may often hasten the cure by administering at the same time ergot of rye. I have tried this oil in chronic bronchitis accompanied by profuse expectoration, but without any good results.

Case 1.—J. H. C., aged 26, consulted me in September, 1865, for a gleet of three years' duration, and for which he had been taking various remedies. Considering this a good opportunity for trying the oil of sandal wood, I ordered him the mixture No. 1. Coffee and spirits were forbidden. The dose of oil was gradually increased, its use being only omitted once, owing to a slight dyspeptic attack. At the end of eight weeks this patient was completely cured.

Case 2.—J. M. consulted me in December, 1865, for a gonorrhœa, which had existed five days. I ordered him the mixture No. 2, under the use of which every symptom disappeared at the end of four days.

Case 3.—J. E., æt. twenty-one, of a cold lymphatic temperament, consulted me November, 1865, for a gonorrhœa of about one week's duration, being the third he has had; he has always experienced considerable difficulty in getting cured. I ordered him mixture No. 1, with an injection of a strong effusion of green tea twice a day. At the end of the week, being no better, mixture No. 2 was ordered, but as the patient did not like it, returned to No. 1, under the use of which the disease disappeared.

Case 4.—H. J., aged 24, of a strong and healthy appearance, but as I subsequently learned of very dissolute habits, consulted me March, 1866, for a virulent gonorrhœa, for which he had been taking copaiba capsules. I put him at once on mixture No. 2 and had him cured in a fortnight.

Case 5.—E. W., aged 18, consulted me also in March, 1866, for a first gonorrhœa, which only appeared two days previously. As he was rather frightened, he promised to abstain from spirits, &c. Ordered mixture No. 1, under which he was cured in seven days.

The above cases have been selected from a few others in which the same treatment was pursued. I have no theory to offer on the mode by which this oil cures, but leave the facts to speak for themselves.—*Medical Mirror, Sept.* 1866, *p.* 543.

59.—COPAIBA DEPRIVED OF ITS DISAGREEABLE SMELL.

Copaiba and pitch, of each one ounce; magnesia, a sufficient quantity to make a mass. According to the greater or less amount of magnesia, the mass will be more or less consistent. If the latter, a teaspoonful may be given two or three times a day; if the former, pills may be made. M. Beyran, of Paris, has found this preparation not only effectual, but to present none of the usual and very offensive odour of the copaiba.—*Lancet, July* 8, 1865, *p.* 34.

MIDWIFERY,

AND THE DISEASES OF WOMEN, ETC.

60.—A NEW METHOD OF INDUCING PREMATURE LABOUR.

By Dr. Lumley Earle, Obstetric Surgeon to the Queen's Hospital, Birmingham, &c.

The plan which I am going to submit to the notice of the profession is not intended to supersede all the well-known modes of inducing labour, and probably a method never will be devised which will be equally suitable, although it may be applicable, in all cases.

Medical men often have what they call "a favourite" method of performing the operation, and adopt it in all instances; this I believe to be a mistake. The plan selected should depend upon the nature of the case—e. g., rupture of the membranes is preferable in severe cases of general anasarca, which disease is generally associated with dropsy of the amnion, and in accidental hemorrhage. Ergot is most suitable in nervous women who obstinately refuse the use of "instruments," or any local means. Kiwisch's method of injecting water forcibly against the os uteri ought to be exclusively used in those rare cases in which such extensive deformity exists, or so large a tumour fills up the cavity of the pelvis, that the os uteri cannot be reached by the finger; and in retroversion of the uterus, if a catheter or other instrument cannot be insinuated within that organ. Dr. Barnes' india-rubber bags are most useful in all instances where it is necessary to commence and terminate the labour in a few hours, as in placenta prævia, puerperal convulsions, &c. Separation of the membranes from the walls of the uterus, by passing an elastic catheter between the uterus and the membranes, and either leaving it there, or removing it after having slightly moved it from side to side, is best adapted in cases in which there is only a moderate contraction of the brim of the pelvis.

The new plan is intended to remove certain objections attached to the two modes of inducing labour with an elastic catheter. The objections are these: If the catheter is simply passed between the membranes and the uterine wall, moved from side to side, and then removed, it does not always induce uterine action, and it requires more manipulative skill and experience than most practitioners possess. In the hands of Dr. Arthur Farre, it has proved most successful; but in the hands of others it has often failed. If the catheter is passed in a similar manner, and left in the uterus, and tied to the patient, although it is much more certain in its action, the patient has to stay in bed until labour comes on, as it would not be altogether safe for her to walk about with the instrument retained. It is very advisable that the patient should be able to go about her ordinary duties until uterine action sets in, because her thoughts then are not so liable to be fixed exclusively upon the recent operation or the forthcoming delivery.

The principle upon which the new method acts is exactly the same as that of the catheter—viz., by separation of the membranes, and irritation. The instruments consist of—

1. One or more pieces of native india-rubber tubing of the length and size depicted in the engravings. One end is closed and the other open. To the

open extremity is attached a piece of strong thread, to enable the tube to be removed when necessary. Fig. 2 shows a longitudinal section of the tube.

2. A whalebone sound or guide fourteen inches long. Fig. 3 represents the tapering extremity of the guide, which must be made to fit the tubes so loosely that, if the two were inverted, the tube would fall off immediately. At the same time, the point of the guide must not be made so fine as to endanger the structure of the india-rubber.*

Labour should be induced as follows:—Place one of the tubes on the tapering end of the whalebone guide (Fig. 1), which must be held lightly by the right hand. Then, guided by one or two fingers of the left hand, pass the tube into the os, and gently push it on between the membranes and uterine wall for several inches, as far as it will go readily. No more force should be used than is required in passing a catheter into the female bladder. If any resistance be met with, it should be overcome by passing the tube in another direction. Lastly, slowly remove the whalebone guide, leaving the tube in the uterus. One or more tubes may be passed in the same way, but in a different tract. The patient need not be undressed, and, after remaining quiet for about an hour, may get up. The hydrostatic pressure of the liquor amnii below the india-rubber tube or tubes will prevent them from readily falling out of the uterus. If in twelve hours the tubes are still in the uterus, and labour pains have been felt, they may be removed by pulling the string. The string should be just long enough to hang about three inches out of the vulva, and the patient should be warned not to let it get entangled in her clothes—in fact, it would be better to pass it into the vagina.

The advantages of this method are:

1. Its safety both to mother and child. The india-rubber tubing is soft and compressible, and during its passage into the uterus is much less likely than the catheter to rupture the membranes on the one hand, or to injure the uterus on the other.

2. The patient can walk about, retaining this small foreign body in the uterus, without any risk.

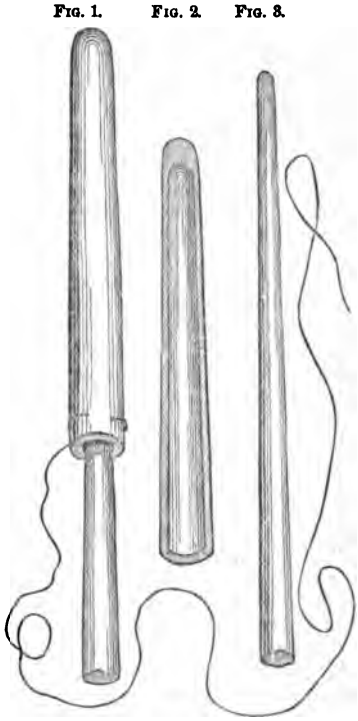
3. The operation is very easy to perform, and does not require more than ordinary skill.

4. It is not only safer than the catheter left in the uterus, but probably more efficient than the catheter when it is merely passed into the uterus, and withdrawn after having been slightly moved from side to side, as it acts both by separating the membranes and also by irritation, not set up through any offensive emanation due to decomposing fluids, but by the mere presence of a foreign body.

5. More than one tube can be passed into the uterus with safety, thereby separating the membranes more extensively, and setting up irritation in more than one place.

6. The whalebone guide is preferable to a metallic sound, because, on account of its flexibility, it facilitates the introduction of the india-rubber tube into the uterus. If any obstruction is met with, the whalebone imme-

Fig. 1. Fig. 2. Fig. 3.



* The whalebone guide, with six india-rubber tubes in a neat paper box, can be obtained from Mr. T. P. Salt, Bull-street, Birmingham, price 5s.

diately bends, and the smooth and yielding nature of the india-rubber causes it to take a more favourable direction.

I can only bring forward at present one case in proof of its efficiency; and although it is unadvisable in most instances to urge the value of a new method of treatment from its success in one case, I consider this new plan to be an exception to the rule, as it is founded upon an old principle which has been well tried and approved of. From what I know of the action of the catheter in the uterus, I felt as certain as I could be, without trying it, that it would succeed, and I should have been surprised if it had not.

Mrs. L., aged 37, a married woman, residing in Newhall street. The following is her obstetric history:—The first two deliveries were good. The third, fourth, and fifth were very bad, each increasing in difficulty, but not instrumental. The sixth and seventh labours had to be terminated by craniotomy, extraction with the forceps first having been attempted. In the eighth pregnancy premature labour was induced by Mr. Clay, of this town, and delivery effected by turning. In the ninth and tenth pregnancies I brought on labour both times by passing an elastic catheter between the membranes and the uterus.

The present was her eleventh pregnancy. According to her calculations, she had gone just seven months. I first intended to have waited at least a fortnight before performing the operation, as her children at the seventh month were unusually puny and weak, and either were stillborn or died within twenty-four hours. On examination, however, I found her to be very large, as if she had very nearly gone her full time. Only one fœtal heart could be heard beating, but there appeared to be two placental bruits, one at each side of the fundus. The condition of the os was such as to confirm the patient's opinion that she was in the commencement of the seventh month of gestation. My idea was that she was either carrying twins, or that there was dropsy of the amnion. Not feeling certain, and fearing lest she should have miscalculated, I thought it would be better to induce labour in a few days. Accordingly, on Saturday, June 9, at 9.30 a. m., in the presence of Mr. George Jones, who kindly gave me the benefit of his advice, I passed up two india-rubber tubes between the membranes and the uterus. This was very easily done, and the patient did not complain of pain. At 12 a.m., while walking about, one of the tubes came away. In passing the second tube, I did not take particular care to pass it into a different direction from that of the first, and it probably passed along the same track, and, not being far from the os uteri, more readily came away. At 7 p. m. the pains commenced, and were repeated at intervals of about half an hour. At 10½ p. m. I removed the remaining tube. Like the first, it was full of blood mixed with a sero-gelatinous material, and there was also a slight discharge of the same fluid. No particular change was noticeable in the condition of the os. On visiting her next morning at 11.45, I was informed that the pains now came on every quarter of an hour, were strong, and lasted for some considerable time. The os was somewhat dilated, but not sufficiently to enable the presentation to be made out. There was a slight brownish discharge, which appeared like blood which had undergone a certain amount of extravasal change, mixed up with a gelatinous secretion. It was not offensive in the least. At 6 p. m. I was called to see her. The pains were recurring every five minutes, and the os was dilated to the size of a florin. The finger could not reach the presentation in the ordinary way, and therefore I did what I always do when uncertain as to the position of the child—I passed up the hand into the vagina and felt the head presenting. At 9 p. m. the os was fully dilated. The membranes were very tough, and I was obliged to rupture them with Lee's trocar. The child was born naturally at 9.40; it was alive, but very small and feeble. On examination, I felt the head of a second child presenting. The pains soon recommenced, and each was attended with severe hemorrhage. I then ruptured the membranes, which were also so tough as to require the use of Lee's trocar. As the hemorrhage continued notwithstanding, and the head was still high up, not apparently making any progress, I thought it advisable to deliver by turning. The

second was stillborn, and the first died two hours after; both were males. It was unfortunate that the case turned out to be one of twins, as of course the children were smaller and more feeble than if it had been a single birth. The mother made an uninterrupted recovery.—*Medical Times and Gazette, July* 14, 1866, *p.* 32.

61.—ON COMPOUND ANÆSTHETICS IN MIDWIFERY.

By Robert Ellis, Esq., Obstetric Surgeon to the Chelsea, Brompton, and Belgrave Dispensary.

[It is in actual practice an extremely difficult thing to avoid an overdose of chloroform in midwifery cases by any method hitherto devised; and, moreover, the pains are interfered with, and the parturient effort really protracted. By mixed vapours, as recommended by Mr. Ellis, these dangers are completely avoided, and the expulsive efforts are really assisted by the gentle stimulus these vapours communicate.]

My present purpose is to introduce a new and most simple form of my mixed-anæsthetic inhaler, which will be found, I trust, of value in the lying-in room. This I call the "Obstetric Inhaler." It combines all the excellencies of my former instrument, but is much cheaper, less complicated, and has the great advantage of being quite self-acting and self-supplying. It may be used either for pure chloroform, or for the mixed vapours, as may be required.

It consists (the face-piece, &c., being all as usual) of two parts—an upper, which holds the chloroform or other anæsthetics, and a lower for the alcohol and general evaporation of the fluids. The upper part is an entirely new little apparatus which I have designed and perfected for dropping chloroform in an equal ratio per minute: this I call the "chloroform-dropper." It consists of a glass bottle of a peculiar construction, perforated at both ends. Up its centre runs a double metallic tube, the inner one of which contains a few strands of wool, and the outer serves as a cap to prevent spilling and irregular action of the apparatus. This is held in its place by a cork fitted into the lower end of the bottle. The upper end has a flat stopper, removable to allow of pouring in fresh supplies of fluids. Now, when a definite quantity of chloroform is poured into this bottle, the wick immediately causes it to rise up the tube, and, descending within it, the fluid appears below in regular drops. The rate at which the fluid comes over is easily learnt by calculation, and there is an engraved scale on the side of the bottle which accurately informs the operator how much fluid per minute is escaping from the bottle, and the consequent per-centage of chloroform vapour which his patient is inhaling. Nothing more is necessary, in order to give chloroform at a rate of from one to three per cent., than simply to pour the fluid, at intervals of five or ten minutes, into this little reservoir, up to the indicated mark for the per-centage requisite. The beautiful regularity with which this most simple instrument prforms its required office must be seen to be fully appreciated. At its highest power it can only give off three per cent. of chloroform. Absolute security is thus obtained, while—a much lower per-centage being, in my opinion, quite sufficient—this can be perfectly secured by keeping the fluid at a certain point by occasional replenishment. Its tendencies, also, are all in the direction of safety, for its rate diminishes, with great equability, from three per cent., until, if left unsupplied, it finishes with about a half per cent. of the chloroform. Thus the patient, once anæsthetised, may be kept in that state with the greatest safety, since at every few minutes she derives a smaller and a smaller quantity of fluid from the apparatus. The lower part consists of a simple metal cylinder, the interior of which is occupied by my arrangement of leaf-like processes for the evaporation of alcohol. Upon this fimbriated structure the chloroform drops, and passes with the alcohol and ether vapour into the respirations of the breather. To this part of the apparatus is attached the elastic tube and face-piece. These have been well made by Messrs. Savigny, the makers of my other apparatus.

In actual practice the instrument is thus used. A certain portion of pure alcohol is poured upon the evaporating surface in the cylinder; this lasts for

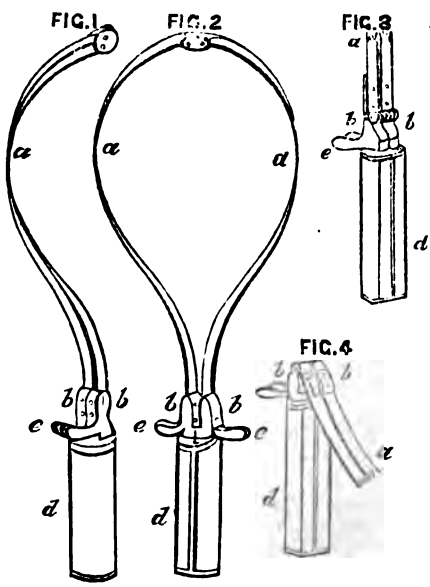
about ten minutes. The chloroform-dropper is supplied up to the required mark on the scale with the fluid, and immediately delivers its contents drop by drop over the evaporator, on to which a few minims of ether are occasionally poured; or ether and chloroform in equal parts may be poured into the dropper, and coming over in single drops are dissipated into vapour with wonderful regularity. But the alcohol cannot be thus mixed; it is always to be poured on to its own proper surface.

The instrument is thus entirely self-acting, and to a great degree self-supplying. It is incapable of derangement by agitation or otherwise; it affords a perfect security to the patient, who cannot draw from it more than a known (and visible) per-centage of chloroform; and it is almost as simple as the commonest kind of inhaler. So soon as these facts shall become known, and mixed anæsthetics more generally used in our profession, I believe the napkin and tumbler system of giving chloroform, especially in midwifery, will drop out of knowledge and practice.—*Lancet, June* 30, 1866, *p.* 708.

62.—THE STEEL FILLET OF G. R. SHERATON, ESQ.

Sedgefield, Durham.

This instrument is intended to supersede the forceps, vectis, &c., in cases of difficult parturition where the use of these instruments is indicated. It is constructed by combining a rotatory action with the fillet principle. It consists of two blades (*a*, Figs. 1, 2, 3, 4) of highly-tempered and flexible steel, curved in a somewhat sigmoid form, fitted and flexed into the rotatory bars (*bb*) of the handle (*d*) at one extremity, whilst at the other they are united by being riveted into a linked joint (*c*), which allows each blade to rotate in opposite directions to the extent of 90°. The rotatory bars are also formed and fitted with stops to limit their motion to 90°. The rotatory bars rotate upon the handle (*d*), to which they are fixed by nuts being screwed upon their ends to retain them in their position. The handle (*d*) is flattened at the back part to enable the operator to determine with accuracy its relative position to the fœtal head and maternal passages. The rotatory action is obtained by pressing upon the tranverse bars or "lugs" (*e*), by which the blades are formed into a loop (Fig. 2) of elliptical form, having a short or transverse diameter of 4¼ inches and a long diameter of 5½ or 6 inches. Tractile power is obtained by placing the fingers across the transverse bars. Its application may be effected by the blades being parallel (Fig. 1) or a little apart, forming a sort of fenestrum, and is to be introduced in the same manner as one blade of the forceps or the vectis, using the same precautions and preliminary measures as with those instruments. It may be applied over the occiput or chin, as desired; then the blades are to be made to rotate by pressing upon the transverse bars, when it is converted into a loop embracing the head. Its application is facilitated by the form of the linked joint, which renders the instrument, as it were, probe-pointed, whilst its being movable renders it less liable to catch folds of the maternal passages, &c. The flexibility of the



blades allows it to adapt itself to the axis of the pelvis and to the form of the head. The thinness of the blades, from the small amount of space which they occupy, is also calculated to facilitate its application. The fingers are to be placed across the transverse bars, and tractile force applied in the direction of the axis of the pelvis. The amount of compression upon the head is always in proportion to the amount of force required in extraction, and, from the manner in which that compression is applied, it is not liable to cause injury to the child.

The chief advantages which this instrument seems to possess over the forceps are—

1. Its application is easier. *a*. The narrowness of its blades. *b*. The thinness of its blades. *c*. Its flexibility.
2. That one blade is easier of application than two.
3. It is less liable to injure the maternal passages or the fœtal head.
4. It occupies less space than the forceps.
5. It can be used without the knowledge of the mother.
6. From the facility with which it can be applied, the duration of the operation is shortened.

It may be made with a folding joint to render the instrument more portable, as Figs. 3 and 4.—*Medical Times and Gazette, July* 21, 1866, *p.* 74.

63.—ON THE MANAGEMENT OF "RETAINED PLACENTÆ" IN ABORTIONS.

By Dr. C. B. Suckling, Senior Surgeon-Accoucheur Queen's Hospital, Birmingham.

M. J., aged 29, married; fifth child; six months advanced in pregnancy; has hitherto carried her fœtus to the full time of utero-gestation. She was taken with uterine pains early on Saturday morning, February 3, 1866, which continued, on and off, until I was summoned to see her on the following Monday, at 10 a. m. I saw the patient at 10.30, and found she had had pain more or less intense during the previous three days. She had lost but very little blood. A vaginal examination, which is the only one to guide us to an accurate diagnosis in these cases, was at once made. It revealed the presence of the fœtus in the vagina, and a patent state of the external opening of the os uteri. On removing the fœtus, the umbilical cord became detached from the placenta, three-fourths of it being left adherent to the fœtus, and the remaining fourth to the after-birth. This severance was afterwards found to be owing to a state of decomposition which had set in apparently at the time when the pains had been first felt by the patient. As the after-birth could not be felt, and as there was no flooding, after waiting a little time, I adopted my usual course—plugged, and left the patient, promising to return in the course of seven or eight hours; but I requested the attendant to send for me immediately, should any thing occur of an alarming nature during my absence. When I visited the patient again at the expiration of eight hours, I found she had been pretty comfortable, free from pain, and had been soothed by sleep. She told me she had suffered occasionally from pains, but they were of short duration, and had given her but slight uneasiness. On removing the plug, the placenta came away with it, accompanied by a few coagula of blood. There was very little flooding. It may be as well here to remark that the plug I used consisted of shreds of linen—the only available substance at hand.

This case I record as one of very many to illustrate a practice I am in the habit of pursuing in the treatment of cases of abortion, in which the retention of the placenta is a source of trouble and anxiety to the accoucheur. Young practitioners especially have the notion that, at all risks, the placenta should be removed before they leave the patient, and that she is in imminent jeopardy if it be permitted to remain longer than a half-an-hour, or at the most three hours, and they are apt—too apt when nature does not assist them in this much-to-be-desired end—to summon to their assistance the ready resources of art, so abundantly supplied them by those skilful and in-

genious obstetricians whose mechanical inventions for this purpose are most beautifully and cunningly contrived, and who quite ignore the maxim that "meddlesome midwifery is bad." There are many such instruments described in the various works on midwifery. The best of the kind, I think, is the "wire crochet" of Dr. Dewees. With this we could not do any harm if we used the commonest precaution. But I maintain that, in the majority of cases, the finger of an expert practitioner and the *vis medicatrix naturæ* are more to be depended upon than any artificial appliance.

When the placenta can be felt over the os uteri, the finger may be passed around it, and by a little skilful manœuvring it may readily be detached and extracted; but I would not advise any prolonged attempts to dislodge it, as by so doing the material parts may be much irritated, and the patient's suffering greatly enhanced.

Plug and leave the case in the hands of nature. The kind of plug you should use is a matter of no very great moment, so long as it is of a soft and yielding material, adapted to accommodate itself to the parts. In cases of emergency, where no time can with safety be wasted, you will be glad to avail yourselves of a good silk handkerchief, and this I have found to make an excellent tampon, answering every needful purpose. Cotton wool is, perhaps, preferable. Small pieces of sponge, about the size of a walnut, to which are attached pieces of string, are those more generally recommended. One great objection to them is, that when they become saturated with the fœtid discharge they become obnoxious to the patient, and are liable to promote the accession of febrile symptoms. To prevent this, they must not be kept too long in the vagina. Whatever plug we may employ, we should take care that the whole of the vagina be well filled, but not to such an extent as to cause by distension pain—(I may remark here that in midwifery operations we should always endeavor to avoid causing pain to the mother)—but so as to prevent the discharge of blood from the uterus externally. Some may be haunted by the idea that although the plug is *in situ* that internal hemorrhage may take place to an alarming extent, but I do not see how this can occur to any great degree when we bear in mind that there is a small uterus, not large enough to admit the hand, partly occupied by the placental mass, and the os uteri blocked up by the artificial plug. In my own practice, when I adopted the treatment I am describing, I have seldom met with hemorrhage that either caused me any anxiety or created much depression of the system of the mother. To recapitulate, I would recommend, in the treatment of cases of retained placenta in abortion, the following points to be observed:—1. If it be possible, remove the placenta by the finger; the sooner this is effected the better, but do not rashly act, and do not let the attempt last too long, as you have nothing to fear by its retention. 2. Plug, and use that which you have the readiest at hand, but the sponge plug, in my opinion, is the best. 3. Wait eight, ten, or twelve hours before you remove the plug, and you will generally find, on removing it, that the after-birth either comes away with it, or it is found lying in the vagina, from whence it may be easily withdrawn.—*Medical Times and Gazette, July* 14, 1866, *p.* 31.

64.—ON A CASE OF RUPTURE OF THE UTERUS DURING LABOUR.

By Dr. Thomas Dalton, Llandudno.

[The patient had been in labour five days, the membranes being broken that time, before Dr. Dalton was sent for. The pains were described as excessively strong and frequent, until a short time before his arrival, when they suddenly ceased. She complained of feeling weak and sick; but did not mention that she felt any peculiar pain or tearing sensation at the time of the cessation of the pains. The pulse was very quick and feeble, but this Dr. Dalton at first attributed to exhaustion from the long-continued and excessive uterine action.]

I found that the presentation consisted of the head and a foot, the head being in the right oblique diameter, and the foot opposite the left sacro-iliac

synchondrosis. The foot was slightly in advance of the head; *but both head and foot had entered the cavity of the pelvis, and were, in fact, quite down on the perineum.* There was a peculiar round tumour on the presenting part of the head, which felt larger and more elevated than an ordinary bloody tumour of the scalp. The pelvis was roomy, and the passages very dilatable. This led me to believe that the case was one of twins, in which both sets of membranes had ruptured, and parts of both children become engaged at the same time. This opinion I continued to hold as the most probable till the post-mortem examination proved that it was erroneous. There was a *very slight* bloody discharge from the vagina. As there seemed to be no reason why the labour should not be concluded naturally, I determined to wait for a short time in order to see if the pains would return; but as the patient continued to feel faint and sick, I gave her a little gin (which was the only stimulant at hand) and warm water. This seemed to revive her a little. In about a quarter of an hour she said she felt a slight pain; but, on examination, I found that it had no effect in advancing the child's head. At the same time I discovered that the foot had receded considerably, although the head was in the same position as before, and had not receded at all. There was still but very slight hemorrhage from the vagina. The patient now complained of a pain in the abdomen, which she could not accurately describe; it was constant, and obviously not connected with true uterine contractions. She did not seem to rally, but, on the contrary, complained of feeling the faintness and sickness in a greater degree. These circumstances, together with the cessation of the pains, the slight discharge of blood, and the weakness and quickness of the pulse, led me to suspect that rupture of the uterus, to a greater or less extent, must have taken place. Having made up my mind on this point, I lost no time in despatching a messenger for assistance, as I considered that turning was impossible, and even, if possible, certainly unjustifiable. For the next half hour there was no great change in the patient's condition, and little or no retrocession of the presenting parts; but she complained of great and increasing abdominal pain. After this she became very restless, her hands and feet became cold, and the pulse almost imperceptible. I had a bottle of hot water put to her feet, and gave her a little hot gin-and-water every few minutes. She then seemed to rally a little; but about an hour after the despatch of the messenger, and just before his return, accompanied by Dr. Nichol, the poor woman suddenly fainted, and, in spite of all my efforts, died from syncope.

From the time at which I sent for Dr. Nichol to that of her death she never had a single pain, and the vaginal hemorrhage did not increase; in fact, the quantity of blood discharged externally during the whole labour could not have exceeded an ounce and a half, or at most two ounces. On further inquiry, the poor woman's husband told me that about ten weeks previously she stumbled in crossing a railway, and although she did not actually fall, she sustained a very severe shock; and that ever after that time she had complained of pain in the region of the uterus. During the last month of pregnancy her general health had been very indifferent; she was very timid, and often said that she did not think that she would get over her confinement, as she felt sure something was wrong, because her feelings were so very different from those she had usually experienced before delivery.

Autopsy.—On opening into the abdomen we found a quantity of serum and blood; there were also one or two adhesions anteriorly. The appearance presented by the uterus was peculiar, for at first sight it seemed very broad, with a sort of sulcus in the middle line of the fundus, as if it were to a certain extent double. On closer examination, we soon ascertained that the whole of the uterus was situated on the left side of the sulcus, and that the portion to the right consisted merely of the expanded peritoneal coat containing the child and the placenta, together with a quantity of blood. Strange to say, this peritoneal covering was to all appearance perfect, though there must have been a small opening in it posteriorly through which the blood escaped into the abdominal cavity. The laceration was posterior and almost longitudinal, extending upwards from the cervix; the fundus had remained partly

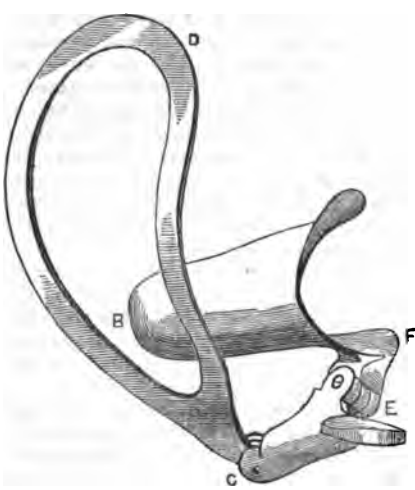
contracted after the expulsion of the child into the abdomen; the lower part of the uterus, especially near the seat of the rupture, was very thin and flabby, and evidently in an unhealthy state. The child—for there was but one—was large and well developed; there was a very large bloody tumour of the scalp, plainly showing that the pressure exerted on it by the uterine contractions previous to the rupture must have been very great. The diagnosis with regard to the presentation, head and foot, proved to be entirely correct.

I forward the above report, as it seems to me that there are several features of interest in the case. In the first place, *any* case of rupture of the uterus must possess a certain amount of interest from the rarity of the accident. Secondly, the presentation was very peculiar, and, as far as I am aware, very rare; for, be it remembered, the head and foot not only became engaged together, but they had actually been so forced quite down on the perineum before the rupture took place. Again, the negative character of the symptoms in this case is worthy of note; for, whilst it is evident that the rupture must have occurred before my arrival at the house, there was, I think, nothing, in the first instance, to lead me to suspect such a frightful accident.—*Lancet, July* 21, 1866, *p.* 64.

65.—EMMET'S PERINEAL RETRACTOR FOR VAGINAL EXAMINATIONS.

Dr. EMMET, Surgeon to the Woman's Hospital of New York, has furnished us with the following description of his speculum:—

"This instrument brings the neck of the uterus into view, as with Sim's speculum, by retraction of the perineum, but with the advantage that an assistant is unnecessary. The patient should be placed in the same position on the left side, the lower limbs flexed well on the abdomen, with the upper or right leg in advance of the under one; the lower, or left arm, withdrawn from under the body, and flexed across the back, so as to rotate the chest as flat as possible on the table or operating chair. The proper position is absolutely necessary in the use of both instruments; and without it is observed in detail, a great advantage is lost. When properly applied, either will expose a larger portion of the vagina than can be done by any other instrument in use.



"After separating the instrument fully, the fenestrated blade, *D*, is turned up as represented in the cut; the vaginal portion is then introduced on the index finger of the right hand, at the same time the perineum is pushed backwards, and the instrument held firmly in position, while the thumb-screw, *A*, is turned by the other hand, until the instrument is adjusted. By the thumb-screw, the point, *B*, of the speculum is carried into the hollow of the sacrum; with the joint at *C*, the blade *D* can be adjusted on the right buttock; by carrying it in the direction *D*, as the lower portion of the instrument in the line *C*, *E*, *F* rests on the lower buttock, along the sulcus, and the vaginal portion is in the shape of a cone, the upper labium of the vagina is elevated. If the cervix uteri is not brought into view, at once, a depressor may be needed to push aside the anterior wall, although as a rule it is not necessary. By elevating slightly the in-

strument at *F*, the point *B* becomes depressed so as to bring the neck often into view, when not presenting. As it is impossible to have a single blade of a size to answer for every case, as with Sim's speculum, a little manipulation is frequently needed when the vagina is unusually long or its wall relaxed; a depressor is therefore required; when once the neck is brought into view, it should be seized by a tenaculum, and drawn in advance of the fold, and it generally remains in position afterwards. The tenaculum may remain hooked into the cervix, as it is absolutely necessary to steady the organ properly during any manipulation, even when the neck is brought into view at once.

"I have used this instrument for the treatment of uterine disease, and for different surgical operations on the base of the bladder, with the greatest satisfaction. Having an experienced female assistant, who has been long accustomed to the use of Sim's speculum, I shall continue to use his instrument to a great extent in my office practice, from the fact that it is applied as soon as introduced. But for an examination without the aid of an assistant, and for long operations, this instrument, when properly applied, affords so great a facility, that I believe, after one has become familiar with its use, it will take the place of all others. It gives no pain, from the fact that the perineum is compressed to one side of the coccyx; and, from the steadiness with which the retraction is maintained, I have found that this instrument is preferred to the jerking and unsteady handling of Sim's speculum by an assistant unaccustomed to its use.

"I am greatly indebted to the skill and perseverance of Ford & Co., of Fulton-street, for putting into practice the principle, after many disappointments and modifications of the mechanical application. They have so constructed the instrument that one of several blades of different sizes can be attached at the joint, *E* when required, although an average size has been fixed upon as the standard, which will answer for nearly every case by a little dexterity on the part of the operator."—*New York Medical Record, May* 1, 1866, *p.* 115.

66.—ON THE RELATION OF PHLEBITIS AND THROMBOSIS TO PYÆMIA.

By William S. Savory, Esq., F. R. S., Assistant-Surgeon to St. Bartholomew's Hospital.

[Formerly, the abscesses which were discovered after death from pyæmia, or detected during life, were regarded as collections of pus which had been merely transferred as such by the circulation from the original source to the structures in which they were afterwards found. Cruveilhier, however, afterwards proved that these secondary abscesses are not simply passive deposits of pus, but that the pus is formed in the situation in which it is found.]

Arnott, in his masterly essay in the Medical and Chirurgical Transactions, after referring the formation of the abscesses in the lungs, liver, and joints, which follow injuries of the head, parturition, great surgical operations, and suppurating wounds, to inflammation of the veins of the part primarily affected and the entrance of pus into the circulation, says, it becomes a question whether the occurrence of phlebitis, and the passage of pus from an inflamed vein into the circulation, are not sufficient of themselves to account for the secondary affections of wounds, without its being necessary to resort to an absorption of the same fluid from their suppurating surfaces.

For some time, however, it was believed that the symptoms of what is now called pyæmia were due to the extension of inflammation along the veins to the heart.

In some cases of amputation, the veins; in others, the arteries; and in others, again, both the veins and arteries, will be found inflamed, from the point of the stump to the very auricle and ventricle, and in many parts lined with coagulable lymph, or filled with purulent matters, to various distances.

When a vein is wounded, the inflammation, which is the effect of the injury, sometimes extends along the lining of the vessel into the principal venous trunks, and in some instances even to the membrane which lines the cavities of the heart.

Hunter wrote, "it may either be that the inflammation extends itself to the heart, or that the matter secreted from the inside of the vein passes along that tube in considerable quantity to the heart, and mixes with the blood."

He says further on, "in all cases where inflammation of veins runs high, or extends itself considerably, it is to be expected that the whole system will be affected. For the most part, the same kind of affection takes place which arises from other inflammations, with this exception, that where no adhesions of the sides of the veins are formed, or where such adhesions are incomplete, pus passing into the circulation may add to the general disorder, and even render it fatal."

Mr. Arnott showed the fallacy of the doctrine just alluded to, and argued "that death in cases of phlebitis does not take place from inflammation extending to the heart, but that the entrance of pus or even of some other product of inflammation from the inflamed part of the vein into the circulation is the source of the alarming and fatal indisposition."

Cruveilhier "argued that the first effect of all phlebitis is a coagulation of the blood with adherence to the walls of the vessel."

And again, that the deposit of "pus" is not between the vein and the clot formed in its interior, but in the very centre of the latter. But he gave a fanciful explanation of this occurrence.

Another fact pointed out by Cruveilhier is that no ordinary mark of inflammation is ever noticed upon the inner surface of the vein in the various stages of phlebitis, that is to say, no injection of capillary vessels can be discovered. The deep red colour is a stain due to imbibition.

Now, pyæmia is often witnessed without any evidence whatever of phlebitis. The worst forms of phlebitis often exist without producing pyæmia. Indeed, it is very rare to see pyæmia following upon well-marked phlebitis during life. Pyæmia is rarely preceded by any obvious affection of the veins.

"It is quite the exception," says Dr. Wilks, "to discover phlebitis as a cause of infection." Again, "amongst the various causes of pyæmia, phlebitis may take its place, although it is very remarkable how seldom the veins can be found affected." And again, "so far from phlebitis being a cause of pyæmia, it is remarkable how often the former occurs without any contamination of the blood whatever; that is, if we call that phlebitis where we find a vein and its branches quite closed by coagulum or adherent fibrine."

Indeed all agree now that pyæmia often occurs without the least evidence of any affection whatever of the veins.

It must of course be admitted that when after death from pyæmia no phlebitis can be discovered, it may nevertheless exist and escape detection. But this argument has been unduly pressed into the service of those who regard pyæmia as always consequent on phlebitis or some affection of the veins. This objection has been repeatedly urged against the fact that pyæmia often exists when no traces of inflammation of a vein can be discovered. But before any weight can be given to this plea, the connexion between pyæmia and phlebitis, or even thrombosis, must be established upon better evidence than that by which it has been hitherto supported.

Then Gulliver demonstrated the important fact that what was regarded as pus in the interior of the veins was, although a puriform, not a purulent fluid. The experiments and observations recorded in his admirable paper led him to the following conclusions:

"1. That coagulated fibrine, when removed from the body and subjected to a blood heat, commences to soften in about forty hours, assuming the colour and consistency of pus, but easily distinguishable from it by microscopic and chemical examination.

"2. That the purulent-like fluid found in the fibrinous clots of the heart and arteries, and so frequently in the veins, is essentially distinct from pus, and analogous to, if not identical with, softened fibrine.

"3. That the softening of coagulated fibrine is an elementary pathological condition of frequent occurrence, distinct from suppuration, and constituting a considerable proportion of the cases generally denominated suppurative phlebitis."

Dupuytren, but after Gulliver, remarked that the so-called pus in the veins may be due to an alteration effected after death. The greyish clots and puriform appearance may be but an effect of stasis of the blood, of fever during life, and of the temperature which remains some time after death.

Veins may inflame. But Virchow and others have shown that phlebitis does not lead to pus in the canal of the veins; nor even, it is affirmed, always to coagula.

Phlebitis "is an inflammation which really affects the walls, and not the contents, of a vessel. In the larger vessels the most different layers of their walls may become inflamed, and enter upon every possible phase of inflammation, and yet all the while their channel may remain entirely unaltered." "Hitherto no experimenter who carefully prevented the blood from streaming into the vessels has succeeded in producing an exudation which was deposited in their cavity. On the contrary, when the wall is inflamed, the exuded matter passes into the wall, which becomes thicker, cloudy, and subsequently begins to suppurate. Nay, even abscesses may form, which cause the walls to bulge on both sides like a variolous pustule, without any coagulation of the blood ensuing in the cavity of the vessel. At other times, certainly, phlebitis, properly so-called (and in like manner arteritis and endocarditis), is the cause of thrombosis, in consequence of the formation of inequalities, elevations, depressions, and even ulcerations upon the inner wall, which favour the production of the thrombus. Still, whenever phlebitis, in the usual sense of the word, takes place, the alteration in the coat of the vessel is almost always a secondary one, and indeed occurs at a comparatively late period."

That the fibrinous deposit so often found upon the lining membrane of veins is from the blood, and not lymph from the walls, seems proved by the following facts, which may be repeated here.

It never occurs in a part from which blood is excluded; and lymph has never been produced upon the lining membrane of a vein in any experiment when blood was excluded from the canal.

It can be detached, for the most part, with facility from the lining membrane, which then presents a natural aspect, or is at least only somewhat blood-stained.

Such deposits of fibrine are often continuous with undoubted coagula, which have not yet lost their colour.

Thus the old idea that lymph may be poured out from the lining membrane of a vein, and that pus may be formed in the canal, depended upon a misinterpretation of what was observed in veins which had been plugged by coagula. When clots form in veins they, after a while, gradually lose their colour, and usually at length disintegrate. Such disintegration, advancing most rapidly in the centre of the clot, gives rise to a granular and oily matter which is puriform to the naked eye, while around there is a shell of fibrine presenting the characters of ordinary lymph.

There is much evidence, but of a very contradictory nature, concerning the existence of pus in veins. However, it may be affirmed that it is not yet established that pus is ever found in veins except under peculiar and extraordinary circumstances, such as those already alluded to. Just as the evidence of inflammation of the lining membrane of veins, such as the presence of effused lymph, has broken down under critical examination, so the presence of pus in the interior of a vein becomes more rare and exceptional the more thoroughly the subject is investigated.

But Virchow and Kirkes have shown how fragments of fibrine, being detached from the cardiac valves or from the interior of vessels where they had formed, or becoming disintegrated in the manner described by Gulliver, may pass into the circulation, be transported to distant parts, and at length, according to their size, block up arteries or capillaries. To this process of obstruction of remote vessels by fragments which have been detached from a disintegrating thrombus, or clot formed in a vein, Virchow gave the name of *embolia*.

Thus arose the great doctrine of the cause of the secondary deposits of pyæmia, which Virchow has expounded with such masterly skill. According

to this, the metastatic deposits have their origin in embolia. A clot, which has formed in some vein, softens and crumbles away, or minute particles are detached from the surface of a cardiac valve. The granules, thus set free, are carried to distant parts, and at length block up the finer vessels. Thus, mechanical obstruction is the starting-point of the mischief. In explanation of the small and very numerous deposits which are often found, Virchow goes farther, and declares it to be a necessary inference that, when a considerable fragment of a thrombus becomes wedged at a certain point in an artery, it may, in its turn, crumble away through the onward pressure of the blood, and thus the minute particles to which this crumbling of the larger plug gives rise be conveyed into the small branches into which the vessel breaks up.

But clots in veins often occur, and softened ones too, without the occurrence of pyæmia. "It may be observed," said Gulliver in the paper referred to, "that the softening of fibrine certainly occurs sometimes without appreciable suppuration in any part of the body. This, however, constitutes no fatal objection to Virchow's doctrine, for in such cases conditions may, and often do, exist which prevent the passage of the granules of fibrine into the circulation. But not only may softened clots exist without pyæmia, but, what is more to the point, pyæmia may occur without any evidence whatever of the existence of softened clots.

And when in pyæmia the veins are found affected and filled with coagula, in what relation does this stand to pyæmia? May not both be effects of a common cause—of the absorption of poison which at once contaminates the blood and causes its coagulation in the nearest veins through which the poison first passes, perhaps inflaming, or at least irritating, their walls? May it not be that thrombi, and even phlebitis, are the local, and "pyæmia" the general, effect of the passage of the morbid poison into the blood? But neither phlebitis nor thrombi, nor any affection of the veins whatever, is a necessary link in the production of pyæmia.

Thus, as the relation formerly supposed to exist between phlebitis and pyæmia was set aside because there is no evidence to support it, so the relation of thrombosis—which has been substituted for phlebitis—to pyæmia is, in its turn, open to at least this objection, that many cases of pyæmia occur which cannot fairly be referred to this cause; many even in which there is no evidence to show, and no reason to believe, that they have been preceded by the formation and softening of any clot.

In the present state of our knowledge, then, the relation in which an affection of the veins stands to the pyæmia appears to be this.

They may be throughout perfectly healthy. For it will not do to argue that when, in pyæmia, no morbid condition whatever of any vein can be discovered, that nevertheless it exists, and escapes detection. This is possible, of course; but in the absence of evidence to support it, with the proof that such a condition is by no means necessary to the event, and that all the effects witnessed in pyæmia may be otherwise produced, such a doctrine has no claim to acceptance.

The veins may be inflamed. Now the only acceptable explanation of the way in which pus—as pus—can pass into the circulation, except in extremely rare and exceptional instances, is that it is formed in the interior of veins as a consequence of phlebitis. Yet not only do cases of pyæmia occur without the slightest evidence of phlebitis, but—assuming that our knowledge of phlebitis is still very defective, and that the present views need some qualification—evidence is wanting to show that in phlebitis any matter is added to the blood, or any change induced in it which causes pyæmia. Yet it is quite possible or probable that the veins, when inflamed, may, like other inflamed structures, furnish some morbid matter which affects the blood.

One or more veins may be occupied or filled with coagula more or less adherent, and in various states; firm and solid throughout, or softened, or even diffluent. But, in the majority at least of cases of pyæmia, there is no evidence of the existence of such softened clots, or that such matter has passed into the circulation.

[Mr. Savory then passes on to the question as to the relation between

thrombosis and phlebitis. The specimens in the museums of the London hospitals prove that phlebitis never occurs without some degree of plugging or deposit of fibrine in the canal of the vessel, but that on the other hand a vein may be plugged without such previous alteration of structure as is attributed to phlebitis. In examining the vein after death, we find both alteration in its structure and fibrinous deposit in its interior.]

Which occurs first—the changes in the wall of the vein or the coagulation of the blood in its canal?

In some cases unquestionably the coagulation, for it sometimes happens that a vein, which previously gave no sign whatever of being in any way unhealthy, will suddenly become plugged throughout, and at this time the most careful examination can detect no change whatever in the walls of the vessel. In such a case the clot may shrink or disappear, and the vein may resume its natural condition, no traces of the previous mischief remaining, or there may ensue upon the thrombosis those symptoms of phlebitis and those changes which lead to the alterations of structure just alluded to.

On the other hand, but these cases are undoubtedly more rare, the symptoms of phlebitis seem to precede the formation of a clot in the canal. For some time after pain and tenderness have existed in the course of a vein, evidence may be obtained, by pressure and otherwise, that the blood still flows through it. If the mischief progresses, however, this evidence soon disappears.

Thrombosis, then, without phlebitis, is evidently of more frequent occurrence than phlebitis without thrombosis.

But if either may exist without the other, what is the cause of thrombosis?

It must be confessed that thrombosis sometimes occurs, and these are the most striking cases, under circumstances in which the cause of it is altogether a mystery. When clots form in portions of veins that have been torn or bruised, or otherwise damaged, we may explain the mode in which they are produced. When they arise in veins which communicate with wounds or diseased structures, or even in veins which are compressed so that their current is interrupted, we may still assign a cause for the result. In an altered condition of the venous channel, in some abnormal state of the blood passing through it, or in some obstruction to its flow, we may perhaps discern something of the cause which determines its coagulation. But in our museums specimens may be found of veins which are plugged with clot, the coats of which are nevertheless apparently quite healthy. If, then, we conclude that healthy vessels may become plugged, we must seek elsewhere than in the vein for the cause of coagulation. But it may be that incipient changes in the lining membrane of the veins, which may not yet have advanced sufficiently to be observed, may have still determined the coagulation of the blood. It may be so when the coagulum is recent. But this idea is hardly tenable against the fact that there are specimens of veins which contain old clot, clots which have existed long enough to undergo the usual changes in vessels, the walls of which are still free from any visible morbid change. If the formation of clot had been determined in these cases by the morbid state of the vein, it is reasonable to believe that during the time the clot has been undergoing the ordinary changes the disease of the vessel would have become apparent. From the consideration of these latter cases, then, the conclusion is drawn, not only that clots may form in healthy veins, and that, therefore, in some cases at least, the cause of the coagulation must be independent of any disease of the vessels themselves, but that the existence of a clot in the canal does not necessarily provoke disease in the walls of the vessel.

Now, when a certain vein, or series of veins, apparently in all their integrity, communicating with no diseased or injured part, and carrying blood like that which circulates through neighbouring and other veins—when a set of veins under these circumstances becomes almost suddenly filled throughout with clot, where, in what direction, are we to look for the cause? Is it in the vessels or in the blood? The vessels have given no previous evidence

whatever of any morbid condition; nor, perhaps, will any be discerned afterwards by the most minute scrutiny. No local disease exists, nor has any injury been sustained. And let it be observed that, even for the moment assuming one of these, it will not account for the extent of the clot, for coagula formed in such cases are limited in their extent. Again, if the blood be in fault, why is the effect so local, limited to certain veins, or, indeed, to the veins at all? for it would appear, as a rule at least, that arterial blood deposits fibrine more readily than venous. The assumption of some spot of mischief as a starting-point would not go far enough; the assumption of some affection of the blood would seem to prove too much.

[Many suggestions have been made as to the mode of arrest of circulation in the vein. These, however, only show how very far we are at present from any knowledge of the pathology of thrombosis.]

Still, in the midst of the darkness may be found, perhaps, some clue to the direction from which light may be hereafter thrown upon the subject.

However much the formation of clots in veins may be influenced by the quality of the blood and the rate of its movement, the determining or essential cause must surely be, in many cases, a local one, otherwise it would seem that coagulation ought to be more general, and not limited to this or that particular vein. It might be, on the one hand, that such local cause would often prove inoperative unless assisted by an increased disposition to coagulate on the part of the blood, and yet, on the other hand, if sufficiently intense, it will speedily induce the formation of a clot, be the condition of the blood what it may. Thus thrombosis appears to be the almost inevitable result of certain changes in the walls of the veins, and I do not remember to have seen a vein which was thickened and indurated, and exhibiting the changes usually attributed to phlebitis, the canal of which was nevertheless free from clot. That the disposition of the blood to coagulate is powerfully influenced by the nature of the surface with which it is brought in contact seems to be a well-established fact. It was pointed out by Hunter, has been more or less clearly recognised ever since, and recently more fully demonstrated by the experiments of Lister. Thus, whatever may be the cause of it, there is a striking difference in this respect between dead and living parts, and living parts themselves possess different degrees of influence. So Hunter, after pointing out that "the want of disposition to coagulate whilst moving in the living vessel does not arise from the motion," goes on to say, "This harmony of the blood with the solids is more observable in some parts than others. The parts with which it is in the greatest harmony are the vessels; this is evident from its retaining its fluidity longer in contact with them without motion than in any other part of the body, though equally enclosed in living parts." But this, of course, applies to the blood and the vessels only in a natural and perfectly healthy state, and it is not difficult to believe that any deviation from this—whereby the harmony is disturbed—must proportionately tend to determine the formation of clot.

With reference to the cause of thrombosis, and more especially to the tendency of the blood itself to coagulate, it should be observed that the clots found in the interior of veins may fairly be divided into two classes. In one, the clot is a simple solid cord, and presents on section an uniform structureless surface. In the other, the clot is distinctly laminated, and a section shows a number of concentric layers. This difference, which is equivalent to that observed in the interior of aneurismal sacs, must imply a difference in the mode in which the clot was formed. In the first case it would seem as if the whole of the blood with which a vein is filled had throughout coagulated, the vessel subsequently contracting upon, and adapting itself to, the clot as it shrunk. In the second, it would seem as if that portion only of the blood in direct contact with the wall of the vessel had deposited a layer of fibrine, and that within this another had afterwards formed, and so on. This view is strengthened by what is often observed in the examination of these cases. In recent ones, sometimes the whole canal of a distended vein is found filled with a large dark soft uniform clot. In other cases, perhaps old ones, when the canal of a large vein is laid open, it may, at the first glance, appear of its natural size, and little or no thickening of the wall

may be observed, but more minute observation shows that upon the lining membrane is deposited a thin layer of fibrine. Further, it is to be observed, what from this point of view would be anticipated, that when the contents of veins of about the same normal diameter are compared, those clots which are formed of concentric layers usually far exceed in calibre those which are uniform throughout.

But to conclude, the sum of all that has been said amounts to this—

Thrombosis may exist without any evidence of phlebitis, and very often occurs without being followed by pyæmia.

Phlebitis may occasionally exist without thrombosis, and often occurs without being followed by pyæmia.

Pyæmia often exists without any evidence of thrombosis or phlebitis; still oftener it occurs without any evidence whatever that it has been preceded by either of these, or by any other affection of the veins.

It has therefore not been satisfactorily shown that either phlebitis or thrombosis stands, in an especial or peculiar manner, in relation to pyæmia, as cause and effect.—*St. Bartholomew's Hospital Reports, Vol. II.*, 1866, *p.* 46.

67.—ON THE DIFFERENT MODES OF DEALING WITH THE PEDICLE IN OVARIOTOMY.

By T. Spencer Wells, Esq., Surgeon to her Majesty's Household, &c.

[A great number of plans have been proposed for dealing with the pedicle in cases of ovariotomy. Mr. Wells performed two cases of ovariotomy at Chester, during the meeting of the British Association there last year; in both he used only the clamp. He observes:]

If a pedicle be small enough to be securely held in a clamp of moderate size, and long enough to permit of the clamp being fixed outside the closed wound without much pull on the uterus or broad ligament, I wish for no readier or more successful method. The objections to it are either groundless or trivial. It is said to be very painful; but I have seen a good deal of pull with very little pain, and much more severe pain in cases where the ligature was used than I ever saw in clamp cases. So with sickness; I have seen as much, or more, after the ligature or cautery, as I ever saw after the clamp. It is said to set up fœtid discharge and poison the wound or the patient; and so it does if proper care be not taken. But if the strangulated part of the pedicle which projects beyond the clamp be well saturated with perchloride of iron, as you saw me use it just now, the slough is tanned; it becomes as hard and dry as a piece of leather, and there is an end to that objection. It is said to cause suppuration about the wound; but this, again, I have seen quite as frequently, in proportion, after the ligature or cautery. I never saw more profuse suppuration of the stitches than in one case where I divided the pedicle with the *écraseur*, and closed the wound with platinum wire sutures. Then, after the wound is closed, it is said to lead to a re-opening each month, and an escape of some menstrual fluid. And this is true in some—perhaps in nearly a third—of the cases. But if the patient be prepared for it, it is not of the slightest consequence. The Fallopian tube contracts completely after a few months, and there is no further escape. The fact that it does escape sometimes is to my mind an argument in favour of the clamp; for if menstrual fluid can escape through the partially closed Fallopian tube fixed in the cicatrised wound, so it may escape if the tube be left within the peritoneal cavity, and the result may be a fatal hematocele. I have known this to occur in cases where the ligature was used and cut off short; and I believe it to be one of the strongest objections to this method, or any intraperitoneal method of dealing with the pedicle. As to any fancied impediment to the increase of the uterus in pregnancy, and to its contraction during labour, from the adhesion of the tube to the cicatrix, I can only say that nine of my patients have had children after ovariotomy—two of them two children—and there was no such complaint in any one case. One *real* objection to the clamp is that it may possibly pull on intestine, or a tense pedicle may strangulate intestine (and I have seen one such case). But this objection is

of little weight if the use of the clamp be restricted to cases where the pedicle is so long that there is not much drag upon the clamp. In such cases, I repeat, I desire no better method. But where we have a broad, thick, short pedicle, or a broad connection between uterus and cyst rather than a distinct pedicle, we want something better than the clamp. And we have the choice between wire or needle pressure, the ligature, the *écraseur*, and the combination of crushing and cauterisation, to which I have before alluded as an improvement due to Mr. Clay, for which he has certainly not received due credit.

I say nothing about acupressure or the wire compress, because I have never tried them. Sir James Simpson was successful in one case, and the plan is certainly worthy of trial.

The *ligature* of the pedicle can always be effected by transfixing it, and tying in two or more portions, before the cyst is cut away. Or a clamp may be first applied, in the cyst cut away, and the pedicle then transfixed and tied below the clamp. But, if this be done, the clamp must be loosened before the ligatures are tightened, or the compressed tissues are so held that the knot cannot be tied so tight that it will not slip off as soon as the clamp is removed. If it be desired only to tie the vessels, it may be done by feeling the arteries, and carrying a ligature round them through the pedicle before the cyst is cut away; or, after the application of a clamp and removal of the cyst, holding the pedicle carefully with forceps as the clamp is loosened, and tying any vessel which bleeds. The great objection to this plan is, that there is often much loose cellular tissue, rich in small veins, which go on oozing after all the larger vessels have been tied. Whichever may be the plan preferred, the important question arises, Shall the ends of the ligatures be cut off, and the wound closed? or shall they be left hanging out through a part of the wound, purposely left open for their passage, and that of the slough they embrace when it separates? Dr. Clay of Manchester still advocates this latter practice. I have tried it, and with success in about a fifth of the cases only; and I shall not willingly adopt it again. In its favour, it may be said, that it is a method applicable in all cases; that it secures an outlet for serum from the peritoneal cavity; and that, after the separation of the ligature and slough, no foreign body is left within the patient. But it seems to me better to have a choice of methods, and adopt each in its appropriate case, than to strive after one method applicable to all cases. I think the ligature-threads act as a sort of seton in the peritoneal cavity, set up inflammation, and excite the formation of the serum for which they are said to provide the outlet. Then, if the patient recover (and I have very great doubt whether very many subjected to this plan do really recover), there is a great liability to ventral hernia. The cicatrix remains weak at the spot where the ligatures passed out, and it yields before the pressure outwards of the viscera. I have seen this in nearly every case where I followed this plan; but I do not remember more than two cases where it followed the clamp. Therefore, if we use one or more ligatures, I am inclined to cut off the ends short, and close up the wound completely. Wire has been used for this purpose; but it seems an irrational practice. Silk, if pure, is an animal substance; and experiment proves that it may be absorbed. Wire cannot be absorbed, and must be more or less of a mechanical irritant. I tried wire on one side and silk on the other side of a sheep on which Professor Gamgee operated for me at the Albert Veterinary College, and the superiority of the silk was manifest. But what we have to look to is the effect on the tissues strangulated, rather than the material by which the strangulation is effected. If anything like what goes on outside the body when the clamp is used, or inside when the wound is left open for ligatures, were to go on when the wound is closed, it is difficult to understand how any patient could possibly survive the process. She would almost infallibly be poisoned by absorption of the fœtid products of the decomposing stump. But a very different series of changes must go on when the wound is closed and access of air is shut off. At any rate, experience proves that patients do survive the process; and *post-mortem* examination has shown that ligature and pedicle have been coated by a sort of capsule of lymph. In my own hands, this practice has been much less suc-

cessful than the clamp; and, even when patients have recovered, some of them have long remained in a state of semi-invalidism, very different from the robust health which is the rule after successful clamp-cases. This plan is that always followed by Dr. Tyler Smith. It was originated in 1821, by Dr. Nathan Smith, of Baltimore, who used *leather* ligatures. Dr. Rogers, of New York, in 1830, also cut off his ligatures "close to the knot, and then left them to absorption." If I use the ligature, I feel disposed to cut off the ends whenever the patient is in pretty good condition, and sthenic peritonitis with effusion of lymph may be expected; but if low diffuse peritonitis and effusion of serum may be feared, then I suspect it would be better to leave the ends of the ligatures, and secure a drain through the wound of the serum. But we should still search for a better method than the ligature.

The *écraseur* I used once, and successfully. But I have not ventured on it again; for, if it should prove untrustworthy, and internal bleeding occur in any case, one's self-reproach would be very painful.

The *cautery* alone would almost certainly fail to stop such large vessels as are frequently met with in a pedicle. So might the *écraseur* alone, or the crushing which precedes division by the *écraseur*. But the combination of crushing and the cautery is certainly efficacious in a considerable proportion of cases. Mr. Clay of Birmingham, as I said just now, introduced the practice, and carried it out by his "adhesive clamp" and hot irons. I wrote to him at the time, that, if it answered for adhesions and omentum, it ought to answer for the pedicle. And I might have tried it; but my first trial on a piece of omentum was unsuccessful, and I did not repeat it. But latterly Mr. Baker Brown has published so many cases in which he has so successfully secured the pedicle on Mr. Clay's principle of combining pressure with the cautery, that I have tried it in five cases. Three of the patients recovered, and two died. In three, the cautery was alone sufficient to stop all bleeding. Two of these patients recovered, and one died. In two others, on opening the clamp, considerable vessels bled, and ligatures had to be applied. One of them recovered and the other died.—*British Medical Journal, Oct.* 6, 1866, *p.* 378.

68.—ON THE TREATMENT OF THE PEDICLE OF OVARIAN TUMOURS BY THE ACTUAL CAUTERY.

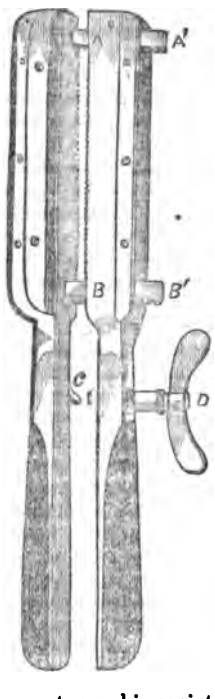
By I. B. Brown, Esq., London.

Mr. Baker Brown read a paper (at the Meeting of the British Medical Association at Chester last year) on the treatment of the pedicle of ovarian tumours by actual cautery. This practice has been adopted by the author in thirty-six cases, twenty-three of which had previously been given to the profession in two papers read before the Obstetrical Society. Mr. Brown now gave in detail thirteen more cases. The following analysis will show the result of this treatment:—Of the whole number, five have died, of which two occurred in the first twelve, and three in the present series. In not one of these had death resulted where the cautery had been used alone, with the exception of the second; here death was due to hemorrhage from the site of an adhesion in the utero-rectal fold, which could not safely be reached by the actual cautery. In the remaining four, one or more ligatures had been used in addition to the cautery, the latter, from various causes, not having perfectly secured the pedicle. In these four, the causes of death were respectively—1. Peritonitis, with hypertrophied heart and thickening of aortic valves. 3. Peritonitis; no autopsy allowed. 4. General peritonitis. 5. Shock; a small quantity of coagulated blood on the stump. Mr. Baker Brown drew the following conclusion from his experience of this treatment:—That it is preferable in all cases first to employ the cautery. Should this fail, no harm has been done, and the ligature may be resorted to without disadvantage. The method of using the clamp was fully explained, and a newly-improved instrument was exhibited. This clamp possessed parallel blades, and the bone, formerly fixed to the back of the clamp to diminish heat during

division, was now separated, except by two long rivets, from the blades.—*Medical Times and Gazette, Sept.* 1, 1866, *p.* 229.

69.—ACTUAL CAUTERY PARALLEL CLAMP.

The accompanying woodcut depicts a new clamp, designed by Mr. Thomas Chambers, senior assistant-surgeon to the London Surgical Home for Diseases of Women, &c. This instrument has several advantages over those now in use.



1st. Its great simplicity, and the perfect ease with which it can be applied and removed.

2nd. The instruments now in use, acting like a pair of scissors, press unequally on the pedicle while the blades are being brought together; whereas, with this instrument, the blades being perfectly parallel, the pressure is applied along the whole length of the blades at the same moment of time, and with the greatest accuracy and nicety.

3rd. Being a right-lined quadrilateral figure whose opposite sides are parallel and equal, this clamp can receive and completely compress a larger pedicle than any other instrument of the kind. It has been used by Mr. Holmes Coote as well as by Mr. Chambers, and was found to act admirably. In addition to its value in the treatment of ovarian pedicles, this clamp may be advantageously used in cases of omental hernia where it is found necessary to remove a portion of the omentum; also in castration, hemorrhoids, vascular polypus, &c., &c.

The clamp consists of two parallel blades, held together by two racks (A and B). In these racks a pinion works which is moved by the handle (D). Every half revolution of this handle moves the upper blade one-sixteenth of an inch. When the trigger (C) is pulled back by the index-finger of the left hand, the blades of the instrument are immediately connected or disconnected at the will of the operator or his assistants.

The clamp is made by Messrs. Mayer and Co., of Great Portland-street.—*Lancet, July* 24, 1866, *p.* 71.

70.—ON FIBROUS TUMOURS OF THE UTERUS.

By Dr. R. T. Tracy, Lecturer on Obstetrics in the University of Melbourne, and Honorary Physician to the Lying-in-Hospital.

[The patient was thirty-three years of age, and had had two children, both still-born; the last delivery being ten years ago. She had enjoyed good health until nine months before, when the menstrual discharge begun to be too profuse, on several occasions amounting to severe flooding.]

On making a digital examination the os was found to be healthy, the cervix short, and somewhat more patulous than in health. The uterine sound was introduced, and a distinct tumour found to be imbedded in the anterior wall of the uterus. The sound could be felt passing over the bulging portion of the tumour as it encroached on the cavity of the uterus, and passed in to four and a half inches. Absolute rest in the recumbent position was ordered, enemata of cold water daily, and a supporting diet. After a few days of this treatment I introduced one or two large sponge tents in succession, in order to enable me more fully to explore the cavity of the uterus, so that I

might ascertain whether the tumour was attached by a pedicle round which I might put the cord of an *écraseur*. After full examination, it proved to be imbedded in the wall without an intervening pedicle. I therefore determined to freely incise the os and cervix, in order to follow out the plan noted in my last paper, viz., to equalise the pressure of the uterine fibres on the tumour and lessen its vascular supply.

On May 28th, I freely slit up the os and cervix with my double uterotome, and, after the operation, continued the use of ten-drop doses of liquor secalis cornuti (B. P.), which I should mention had been given three times a day from the time the os and cervix had been opened by sponge tents.

In a few days a purulent discharge began to come away freely. Not a drop of blood was lost by the patient after the hemorrhage consequent on performing the operation had ceased. *The hemorrhage which had been almost incessant, and which was fast wearing the patient out, stopped entirely after the uterotome was used.* A smart rigor occurred on the third day, and the purulent discharge became very offensive. There was tenderness over the lower part of the abdomen, and great irritability of the stomach. Brandy was given pretty freely, linseed meal poultices applied over the abdomen, and opiates were administered at night; warm water injections to the vagina used frequently.

On the 6th June, a digital examination discovered a slight protrusion of the sloughing tumour at the os. The purulent discharge was still very profuse.

On the 14th June, a mass of sloughing fibrous tumour, about the size of a large hen's egg, was expelled, and speedily all the serious symptoms subsided. The pulse, which had been up to 120, soon fell to a natural rate, the sickness of the stomach and the tenderness of the abdomen speedily passed away, and the patient made an excellent recovery. She left the hospital on August 10th, quite well.

I am inclined to believe that in some of my examinations of this case with the uterine sound, I broke into the envelope of the tumour, and caused the more rapid sloughing of the mass. No doubt this aggravated the constitutional disturbances, and, to a certain extent, caused the case to resemble those in which a piece of the tumour is gouged out, and in which pyæmia is too often apt to occur. The vitality of these tumours is so low that very little interference suffices to induce suppuration in the structure.

Case 2.—E. S., aged 45 years, was admitted November 15th, 1865. She had been many years married, but had never been pregnant. She stated that for the last two years she had suffered from severe bearing down pains in the back and abdomen, and had had frequent and severe hemorrhages from the womb. The abdomen had been considerably enlarged for many months. She described the loss of blood to have been enormous at times, and this statement was borne out by her appearance on admission. She was a largely-built, masculine-looking woman, but presented a most intensely anæmic appearance, the skin was of a greenish-white colour, exactly like the appearance presented by the patient suffering from malignant disease.

On examination, however, the os and cervix were found to be perfectly healthy, but flabby and patulous. The abdomen was enlarged to the size of that of a woman four or five months pregnant, and on introducing the sound it passed to six and a half inches.

After careful consideration, and the cautious use of the sound, taking care not to press the point against the tumour, as in the last case, I diagnosed this to be one of non-pediculated fibrous tumour, and as there was no loss of blood on admission, I determined to temporise a little, and abstain from any operative interference until the patient's strength was somewhat rallied, meantime prescribing absolute rest in the recumbent position, nourishing diet, and careful attention to the state of the digestive organs. As the os and cervix were particularly soft and yielding, I determined to administer the liquor secalis in ten minim doses, three or four times a day, in the hope of aiding the uterus to bring down the tumour within the range of the os. The treatment was steadily persevered in, and after she had been about two weeks in the hospital, very violent hemorrhage came on. The ergot was

then given in larger doses, and with very good effect. I intended, when she got stronger, to use the uterotome as in the last case; but as the losses of blood were only occasional, and, with one exception, not very severe, I thought it better to wait until the repetition of the hemorrhage would justify me in interfering. The ergot was still continued, and caused a pretty constant sense of bearing-down pain on the uterus. There was also a good deal of watery discharge from the vagina, but no pus.

On January 3rd the patient presented a remarkably distressed appearance, and complained of a vastly increased pain. The swelling of the abdomen seemed to have gone down into the pelvis a good deal. I had her lifted on to the operation table, in order to make a more perfect examination. I was very much pleased to find that the tumour was protruding through the os uteri; the cervix was as tightly stretched over it as it is in the first stage of a severe labour over a child's head, and the woman had pains as severe as those then felt. After placing her in the lithotomy position, and getting Dr. Mackenzie to make firm pressure downwards over the pubes, I introduced a pair of very strong vulsellum forceps into the tumour, and made steady traction, giving regular intervals of rest, as if I were using the midwifery forceps. It required fully half an hour of patient perseverance in this manner to deliver the mass. It was quite the size of a cocoa-nut, and presented an appearance exactly similar to the white part of the flesh of preserved lobster. Professor Halford kindly examined a portion of it, and found the structure to be a mass of hypertrophied fibrous cells.

From this time the patient never presented an unfavourable symptom; she rapidly gained strength, her complexion cleared up, and she left the hospital quite cured on January 29th, 1866.

This was a most instructive case, occurring as it did in a woman forty-five years of age. The symptoms were, to a great extent, those that might be expected at the climacteric. The wretchedly sallow, unhealthy appearance, and the frequent hemorrhages, suggested the early stages of cancer of the uterus; indeed, so marked were these indications, that before I made a digital examination I almost certainly expected to feel a scirrhous os. The utility of the liq. secalis was well demonstrated, and I am sure that this medicine will be found more and more beneficial in such cases as this if fairly tried. I have proved its efficacy for many years also in cases of chronic uterine leucorrhœa. Had this case been left to nature, it would have brought the wretched patient to the state described in my former paper; sloughing of the mass would have reduced the system to the lowest ebb, and would, indeed, most probably have killed her, and the diagnosis would have been, as in the case before alluded to, cancer uteri in the last stage.—*Australian Medical Journal, Feb.* 1866, *p.* 33.

71.—ON EXTREME SURGICAL TENDENCIES OF UTERINE PATHOLOGISTS; AND ON THE DIVISION OF THE CERVIX UTERI.

By Drs. E. J. Tilt, Henry Bennet, Head, Graily Hewitt, Routh, Barnes, and Mr. Baker Brown.

[The following discussion, at a meeting of the Obstetrical Society of London, embraces the opinions of some of our most eminent obstetric practitioners on modern surgical operations about the os and cervix uteri, and will be generally agreed with.]

Dr. Tilt deprecated the extreme surgical tendency that seemed to characterise the present epoch. He gave as a proof of this tendency the frequency with which operations have been discussed at Medical Societies, the unnecessary multiplication of surgical instruments, and the warmth with which their invention or modification was supported. He likewise noticed two books which have lately appeared: one, a very important work by Dr. Marion Sims, in which constitutional means of curing diseases of women

were almost completely ignored; and another, by Mr. I. B. Brown, in which it was recommended to cure hysteria, epilepsy, and insanity by amputation of the clitoris. Dr. Tilt stated that he had known the division of the cervix uteri to have been frequently performed or recommended in cases where he was able to pass the uterine sound, and he submitted that no practitioner was warranted in dividing the cervix either for sterility or dysmenorrhœa, when the cervical canal had that width; as microscopic animalculæ could find no difficulty in ascending where the uterine sound could pass. He alluded to the difficulty of passing a sound into the virgin womb, which did not interfere with the frequency of conception, in young women, soon after marriage. The author's experience led him to believe that the utility of dividing the cervix uteri had been unintentionally exaggerated. There were no statistics to show that conception was frequent after the operation; and he had frequently been consulted by those who had been operated upon during the last ten years, and who had remained barren. Dr. Tilt argued that there was so great a tendency on the part of the divided surfaces of the cervix to reunite, that the operation was generally useless unless followed up by dilatation; and he thought that in the majority of cases of uterine stricture dilatation was the safest and best way to relieve dysmenorrhœa and to facilitate conception. He wished the division of the cervix to be restricted to cases where the cervical canal was extremely narrow or the cervical walls very hard, and to cases wherein dilatation had proved a failure, or where there was flooding from uterine fibroids. He reserved his opinion respecting the value of the operation in cases of uterine displacement or of malformation; and deprecated the operation being resorted to as a kind of *pis aller* in those intractable forms of uterine disease in which relapses depend either on a congenital unhealthy tendency of the organs of generation, or on some deeply rooted constitutional taint. Dr. Tilt mentioned that in three of his patients the operation had been performed without the knowledge of the patients or their friends, and he took occasion to remark that this did not accord with the usually received notions of medical ethics.

Dr. HENRY BENNET thought that Dr. Tilt deserved the thanks of the society and of the profession for the paper read that evening. Although for the last seven years ill health had kept him out of active practice, he had continued to take the liveliest interest in uterine pathology, and had made himself acquainted with all that had been written or said on the subject. As a result he was deeply impressed with the idea that the therapeutics of uterine disease had taken of late too surgical a direction, and he thought, like Dr. Tilt, that this tendency required restraining, limiting, directing. After a seven years' absence from the debates of the society, he could not but feel that it was passing strange that he should have to rise as a conservative, and that in the very arena where he had many a time, in former days, defended progress, and where he had been opposed and stigmatized as a rash innovator. When he commenced practice in London twenty-three years ago, uterine therapeutics comprised little else but the treatment of cancers, tumours, prolapsus, and constitutional conditions. The most continued and irrational opposition met his efforts to establish more correct views—to demonstrate that physical means of investigation were as imperatively demanded in the study and treatment of diseases of the uterus as in those of diseases of the heart, lung, bladder, rectum, &c. By degrees, however, more reasonable ideas gained ground, and the senseless opposition to the progress of science was vanquished. Now it had entirely ceased, and had become a mere remembrance of the past. Indeed, as stated by Dr. Tilt, the danger rather appeared to be in going too far the other way, and interfering too much. This seemed probable when a recent surgical work on female diseases, written by a clever, experienced laborious American surgeon, his friend, Dr. Marion Sims, proposed division of the cervix uteri on both sides, down to its vaginal attachments, as a remedy for all kinds of morbid conditions, for various deviations, and for sterility. Indeed, the Doctor in one page stated that he and his colleague in the Female Hospital at New York performed this operation 500 times in two years! Again, many recent writers and

operators seemed imbued with the idea that the passage through the cervical canal to the cavity of the uterus ought to be what might be termed, metaphorically, as open "as a carriage door," constantly finding stricture therein. for which they operate by ruthless divisions, if it is not so. He (Dr. Bennet) believed that this view was founded in error, and that the greater part of these cutting operations were not in any respect called for or necessary. He believed also that this error would not be so constantly made were his discovery of a sphincter at the os internum recollected or recognised. This sphincter was a vital contraction of the circular fibres of the cervix at the os internum, similar in function to the sphincters which closed other cavities—the stomach, rectum, bladder. When the cold uterine sound reached it, it contracted, and impeded its entrance into the uterine cavity, and a stricture was declared to exist. A wax bougie, No. 4 or 5, on the contrary, its extremity warmed by the hand. and slightly curved to the shape he had described as that of the uterine passages, generally entered with ease. The patent condition of the cervical passages which these authors appeared to consider necessary for conception was not natural, and certainly not necessary for the entrance of microscopic spermatozoa. It must not be forgotten either, in treating of sterility, that in England one married woman in six is sterile: in America, according to Dr. Marion Sims, one in eight. The causes of sterility were very numerous, and were not to be removed merely by cutting a royal road for the spermatozoa. Moreover, these divisions of the cervix healed up, and in a few months the narrowed condition was as bad or worse than ever in most cases. Twenty years ago, at Sir James Simpson's instigation, he operated in many cases, and all but abandoned the operation on account of these relapses. Since then he had generally used very small sponges if he wished to dilate, and had never once had an accident. The attacks of inflammation that had occurred in the hands of others had no doubt been caused by the attempted dilatation of inflamed tissues. The cervical canal ought to be perfectly sound when it was interfered with. In conclusion, he repeated that he quite agreed with Dr. Tilt that the uterus is now-a-days too frequently intefered with surgically, and that the indications for operations required better defining.

Mr. BAKER BROWN said he thought the paper was brought forward at a most appropriate time, for he perfectly agreed with the author and with the observation of Dr. Henry Bennet that operations upon the cervix uteri were performed too frequently, and without proper regard to preparatory and subsequent treatment. He was glad to have the opportunity of stating before the Society, in the strongest language, his reprehension of the rashness with which this operation was performed in both the out-patients' department of hospitals and the consulting rooms of the operator. He had always taught that the operation of dividing the os and cervix uteri was one of great danger; and although he had performed it a vast number of times, he had never done so without careful preparatory treatment, and the most absolute rest for two or three weeks after the operation. He thought the danger was also increased by the frequent division of the internal os. For his own part, in all cases of flexions, he simply divided the cervix up to, but not through, the internal os; but in all cases of uterine hemorrhage or intra-uterine fibroid tumours, he then carried his incision through the internal os. In all cases, immediately after operation, he plugged with oiled lint, and took every precaution to prevent the admission of atmospheric air. He believed the neglect of these precautions would generally account for the untoward results which so frequently followed the operation. He could confirm all that Dr. Bennet had said as to the opposition and persecution he had met with in reference to his treatment of uterine diseases; and when he reflected how triumphantly Dr. Bennet had overcome all his opponents by the truth of his practice, he (Mr. Brown) felt consoled for the opposition he received for publishing the results of his experience on a subject of which he has yet confessed himself to be but a learner. But as he had always, through a long professional career, immediately published any innovation which he had believed to be practically useful, so he would continue unto the end, feeling sure that the majority of the pro-

fession would always honestly investigate anything which he might place before them.

Dr. HEAD was of opinion that the expression "stricture of the os uteri" demanded a clearer pathological definition. He never had had the opportunity of seeing after death a stricture of any portion of the cervical canal, and thought the specimens must be extremely rare. He believed that cases of coarctation of the os uteri internum, not dependent upon organic disease or deviations of the uterus from its normal axis, may be attributable very frequently to spasm of the muscular wall of the uterus, especially at the orificial zone. Irritation acting upon the lining membrane of the uterus or cervix reflects itself to the muscular apparatus of the uterus much as occurs in cystitis. He concurred with Dr. Tilt in the belief that in numerous cases operative interference had been premature, and that we should hesitate before we appeal to the knife; indeed, that it should be the last resource, and only employed after all constitutional and local measures had been found utterly inefficacious. He (Dr. Head) had lately contrived an apparatus, by means of which the vapour of chloroform unmixed with air can be passed into the cervical and uterine cavities, and had found chloroform vapour thus injected a remedy which was likely to afford considerable relief in cases of neuralgic dysmenorrhœa.

Dr. GRAILY HEWITT believed with Dr. Tilt that the operation of incision of the cervix uteri was too frequently, and therefore unnecessarily, practised. He differed from Dr. Tilt as to the indications for the operation. The uterine sound could frequently be introduced with a little patience in cases where the cervix was for menstruation purposes virtually strictured. He alluded particularly to cases, such as were by no means infrequent, where the canal was distorted and sinuous—a condition arising from thickening of the tissues of the cervix. The mucous membrane might be thickened also; but the chief condition was the irregular hypertrophy of the cervix itself. Then, again, he thought Dr. Tilt attributed too little importance to the effect of the presence of small fibroid tumours in determining flexions and consequent virtual stricture of the cervical canal. He believed many cases of cervical distortion and narrowing could only be dealt with effectually by means of a cutting operation; but the indiscriminate application of the operation was to be strongly deprecated.

Dr. ROUTH said the discussion proved how little the profession was agreed as to either the anatomy or pathology of stricture of the uterine canal. Anatomically, Dr. Savage did not admit a special sphincter at the internal os. Besides, did not circular fibres abound everywhere in the cervix? Then as to the seat of stricture, it was strange to find eminent men—accoucheurs—fixing stricture almost invariably at the external os; whilst others, quite as eminent, place it at the internal os. Then, again, was it to be said the uterine cervical cavity was never to be cut except in cases of stricture?—and could not the depth of the uterine incision be regulated according to the case? In chemosis of the eye, who could deny the advantage of relieving the congestion by incision? So in uterine disease a mucous lining might be so congested as to require scarification. The hysterotome effected this most satisfactorily. In parenchymatous uterine congestion itself it also was most beneficial. In conclusion, he could not allow physician-accoucheurs to remain under the stigma put upon them. Obstetric medicine was essentially *surgical;* and an accoucheur only proved his skill in acting *surgically* when prompt relief would follow, instead of acting *medicinally*, when cure would be thereby made very tardy, or not occur at all.

Dr. BARNES expressed his gratification at seeing again amongst them one who had rendered such eminent services to obstetric science as Dr. Bennet. Referring to his memoirs on Dysmenorrhœa and allied affections depending upon a peculiar conoid form of the cervix uteri with minute os externum, the President reminded Dr. Bennet that he had there quoted and adopted Dr. Bennet's views as to the os uteri internum. He believed that it was very rarely the seat of stricture, or the source of difficulties requiring division. All his experiences still pointed to the opinion expressed in that memoir, that

the os externum was the seat of trouble. And when the peculiar formation which he had described existed, the consequences were very often severe, and even dangerous. He had seen retro-uterine hæmatocele caused by it, and had known examples of young girls dying in consequence. It was absurd to rely upon medicines, or indeed upon anything short of division of the os externum in such cases. As performed by him, the operation had always been safe. Speedy relief followed, and that in many cases which had undergone every other kind of treatment for years before. These were cases for surgical treatment.—*Lancet, Aug.* 25, 1866, *p.* 209.

72.—ON A NEW MODE OF TREATING EPITHELIAL CANCER OF THE CERVIX UTERI AND ITS CAVITY.

By Dr. C. H. F. Routh.

[The following article is an abstract of a paper read by Dr. Routh before the Obstetrical Society of London. The use of bromine was first suggested to Dr. Routh by his colleague, Dr. Wynn Williams. The two cases occurred at the Samaritan Hospital.]

In the first, the patient was thin, pale, and haggard, losing blood continually. There was a mass of fungoid epithelial growths, taking their origin from the os uteri, and about the size of an egg. The actual cautery was used to check the bleeding, and after the slough had come away a solution of bromine—five minims, to fifty of spirits of wine—was used. A piece of lint, the anterior surface of which was well saturated with the solution, was applied to the uterine diseased surface, and kept *in situ* by pledgets of lint. After forty-eight hours it was removed, and the part dressed at night with a poultice of lint dipped in warm water, and during the day warm douches were applied. In about a week a slough came away, and left a large healthy granulating surface. Tannin with glycerine was applied, and used daily. The patient also took internally the iodide of arsenic with extract of conium. After a period of ten weeks she was fat, hearty, and well coloured; but as she occasionally lost a drop of blood, Dr. Routh carefully examined the internal surface of the uterus, and found about a quarter of its lining membrane affected with epithelioma. She left the hospital for some weeks, and on being readmitted a piece of wood about the size of the uterine cavity was prepared, and covered with cotton; the upper part was dipped in a saturated solution of carbonate of soda, the lower in the bromine solution, and it was passed up and left within the uterus. Two or three further applications of bromine with glycerine were necessary, and the patient left the hospital with a movable healthy uterus.

In the second case there was a large carcinomatous mass, about the size of an orange, attached to the os, which appeared to be large cauliflower excrescences, breaking down readily and bleeding at the slightest touch. On the 20th January the mass was removed by the wire *écraseur*, and a few days afterwards the spirituous solution of bromine was applied. She took internally the iodide of arsenic and conium, and was treated in the same manner as the first case. She left the hospital on April 2nd, with a movable uterus covered with healthy mucous membrane, and looking herself fat and hearty.

The author remarked that he was quite aware that two cases afford an insufficient criterion as to the value of any remedy, and that time had not been allowed to prove that the cures were lasting. Notwithstanding these objections, he thought, at the same time, there were some considerations which made an early publication of these cases desirable. The author concluded by drawing attention to the care necessary in mixing the bromine with the spirits, which should be done very gradually, to avoid an explosion. He hoped others would try the agent he now brought forward, and give the results of their experience. He believed it to be a potent and useful remedy, and likely to prove of service, if not in the cure absolutely, at least in the arrest of the progress of cancer.

Dr. WYNN WILLIAMS said that he had applied solutions of bromine, in varying degrees of strength, in cancerous growths where there has been any breach of surface, for some nine or ten years; and for the last two or three years to this disease when attacking the uterus, with the effect of destroying the cancerous mass, and causing its removal by sloughing. The first patient on whom he used it was a man suffering from epithelial cancer which had commenced in the lower lip, the soft parts having been almost entirely removed; and wherever he was able to apply the solution of bromine the wound healed, until the whole external surface of it, extending, he might say, almost from ear to ear, had skinned over. The patient, however, ultimately died from extension of the disease to the neighbouring glands. Dr. Williams considered the beneficial effects of bromine were not confined to its corrosive or escharotic action only, but it acted also as a most powerful disinfectant, its good effects in this way being of very great service. He had seen patients with that peculiar cachectic, emaciated aspect so common in those suffering from open cancer rapidly improve in appearance soon after using bromine applications. He had found that in almost every case in which he had been able to apply bromine directly to the cancerous growth it had been followed by most beneficial results. He had frequently prescribed bromide of iron internally whilst applying the bromine externally, but thought its effect very problematical.

Dr. ROGERS said he believed some of the previous speakers were labouring under an erroneous impression that the paper by Dr. Routh and the remarks of Dr. W. Williams tended to establish a new "specific for cancer." All that was desired to be made known was the fact that in some cases of epithelial cancer of the cervix uteri the bromine had proved a most energetic and valuable escharotic, destroying vascular growths, arresting hemorrhage and the prostration resulting from it, and checking all fetid and foul discharges. Healthy granulations followed its application, and the parts appeared free from disease. How long such improved state would continue could not at present be predicted. This was certain, that a most marked improvement took place locally and constitutionally. The patients would soon have died had not the disease been arrested; now they appeared restored to health and strength again. Of course, where the bromine could not be applied to the whole of the diseased parts, the mischief could not be arrested, and the disease proceeded on its fatal course. Bromine, like other powerful caustics, required great care and all the precautions mentioned by the author in its use. From its not being properly guarded, he (Dr. Rogers) had known mischief to arise which ought to have been prevented. He had used it himself, and had assisted the author with all his cases; and great credit was due to Dr. Routh for the skill, care, and perseverance exhibited by him.—*Lancet, Oct.* 27, 1866 *p.* 469.

73.—DIAGNOSIS OF HYSTERIA.

By Dr. C. B. GARRETT, Hastings.

The morbid sensibility would appear to be pretty much (if not wholly) located in the skin. Take a case of excruciating pain under the left mamma. It is possibly put down as pleurisy, or, at least, pleurodynia. Say that there is a doubt. Well, then, either pressure or a sponge dipped in hot water applied to the spine about the lower dorsal vertebræ will cause an immediate and excessive aggravation of the original lateral pain; but pinching up the skin is an infallible diagnosis, for the pain becomes instantly intolerable. The same thing happens to the joints and any other parts where hysteria may develope itself; so also with those puffy tumours so often seen on the abdomen. I do not allude to the spine in these instances, but the pinching up the skin over the peccant part.

A curious case came under my care a few years ago, in which there was a lamentable failure in diagnosis. A young lady of the sort of temperament described by Mr. Skey took a long ride on horseback. On the following day

her left elbow became painful and puffy. Leeches, &c., were had recourse to, and, as always happens in hysteria, depletion made matters worse. Blisters, mercury, and iodine followed in mournful succession. In about thirteen months after its first appearance she came under my care. The elbow was of great size, and the joint immovable; the case was clearly hysterical. Having administered the mist. ferri co. and tinct. valerianæ ammon. for a few days, I thought the time had arrived for attacking the anchylosis. My patient was placed erect in a chair; I supported the elbow with my right hand, and administered a smart blow or slap with my open left hand on her wrist. She screamed out that something had snapped, and freedom of motion was instantly restored to the elbow-joint. It would appear that in these cases there is a powerful antagonistic action set up by the flexors and extensors against each other, which is obstinately maintained till the balanced opposition is overpowered. Thus luxation of the lower jaw often takes place in hysterical subjects during gaping. I may here add that in the management of hysteria we must make it our motto to use kindness without sympathy, firmness without harshness.—*Medical Times and Gazette, Oct. 27, 1866, p. 458.*

ADDENDA.

74.—CONFESSIONS OF A LAUDANUM DRINKER.

By W. Whalley, Esq., Bradford, Yorkshire.

In obtaining the following brief and somewhat immethodical facts, I experienced some little difficulty, owing to the reluctance evinced by the patient to reveal the true magnitude of her infirmity. For many years her demeanor was so circumspect that some of her most intimate acquaintances were not cognisant of the fact that she did imbibe laudanum. The subjoined particulars were fully corroborated by her husband, and their veracity is perfectly reliable.

On March 19th, 1866, I was consulted by Mrs. K., aged forty-four, who has had eight children, three of whom are living, their respective ages being eighteen, sixteen, and six years. She is about the average height, rather inclined to stoop, and moderately stout. Her hair is very grey, and her countenance had a rather withered, yellow aspect. Her eyes were glassy, and the conjunctivæ straw-coloured. When asked to put out her tongue, she did so tremblingly, which was coated with a brown fur. She complained of headache, loss of sleep and appetite, intense thirst, and her bowels were slightly relaxed. She stated that owing to recent domestic adversities she had indulged in whisky as well as laudanum; of the latter, the average quantity taken the last eighteen months had been a gallon a month. During this period the stomach had frequently retaliated and rejected its contents. She expressed a determination to relinquish the habit gradually if possible, believing that death would be inevitable if the accustomed stimulus was suddenly withdrawn.

About fourteen years ago she suffered from severe pain in the bowels, for which a friend advised her to take twenty drops of laudanum. This she found to afford the desired relief, and on each accession of pain at once resorted to the above remedy. In course of time the pain ceased to annoy her; but a desire for the laudanum had almost unconsciously been acquired, and unfortunately more courage and resolution were essential to its abandonment than fell to the lot of its victim. The habit became more and more confirmed, the craving for the stimulus became increased, and in order to produce the desired effect the dose was constantly augmented, so that after the lapse of a few years she was capable of taking a quart a week. More than this the stomach would not tolerate. Its effects upon her spirits were most exhilarating. She felt lively and cheerful, and could accomplish almost any amount of household work; and instead (as is often the case) of suffering from constipated bowels, with accompanying headache, they were invariably relaxed, and there was entire freedom from headache. She slept well, her appetite was remarkably good; in fact, there was very little, if any, disorder of the digestive organs. The organs of sense did not exhibit any signs or symptoms of impairment, except that of sight, which was not quite so good as formerly. If deprived of the laudanum for a single day, the most unpleasant symptoms came on; loss of sleep and appetite, and an indescribable feeling of languor, with a corresponding depression of spirits, and slight involuntary motions of the limbs, all of which were readily relieved by the accustomed dose of laudanum.

When first consulted by my patient, I fostered the most sanguine hopes of being instrumental in enabling her to conquer her defect. The whisky was

discontinued and the doses of laudanum decreased, and by the aid of salines, &c., her distressing symptoms speedily vanished, her appetite and usual flow of spirits returned, and she was soon engaged in her customary domestic duties. At this period, however, my hopes were suddenly and unexpectedly doomed to disappointment from the absurd intelligence I received from her nearest relatives—namely, that it was their intention to allow her the laudanum, but in smaller doses, they being infatuated with the idea that to discontinue its use entirely would be to endanger her life.—*Lancet, July* 14, 1866, *p.* 35.

75.—PHYSIOLOGICAL ACTION OF NARCEINE.

In the last number of the *Journal de Chimie Médicale* there is an abstract of M. Linné's researches on the above subject, from which we perceive that the following conclusions have been arrived at:—(1.) Narceine is unquestionably of all the alkaloids of opium that which has the greatest narcotic power. *In the majority of cases* morphia and codeia do not produce as sound or as prolonged sleep as results from the use of narceine. (2.) Narceine differs from the other alkaloids of opium in producing little perspiration, and in causing no loss of appetite or nausea. (3.) So far from producing constipation of bowels, it causes relaxation, and, in large doses, actually gives rise to diarrhœa. (4.) It not only produces sleep, but diminishes pain. (5.) It has one peculiar action: it suppresses the flow of urine. For this reason M. Linné thinks that it might be advantageously employed in cases of nocturnal incontinence of urine amongst children. But it seems to us that, until its action can be shown to be on the bladder rather than on the kidneys, its employment in such cases would be highly improper.—*Lancet, June* 9, 1866, *p.* 33.

76.—ON THE MEDICAL USES OF CHLOROFORM INHALATION.

By Dr. Charles Kidd, London.

The medical uses of chloroform, or rather its administration in medical as contrasted with surgical cases, begins to assume a form of very considerable interest and importance to the practising physician—not so much as an agent capable of removing slight or severe pain in neuralgic or purely spasmodic affections, as in controlling dangerous convulsions in the adult or infant, as a remedy also, or auxiliary of great usefulness in various forms of epilepsy, though not so effectual in simple hysteria, chorea, or delirium tremens. The medical uses of chloroform, in a word, have not been recognised sufficiently; its far wider and more brilliant aid to the operating surgeon having somewhat eclipsed its occasional applicability in the less demonstrative clinical wards of the physician. In cases of puerperal convulsions—which come under the notice of the general practitioner or young obstetric physician—the varied experience of all, or of the best obstetricians, agrees that whether we have albumen in the urine or not, the careful, skilful administration of chloroform, even before adoption of the lancet, seldom fails to afford marked relief, and that in a majority of cases we may dispense with the excessive venesections of former times; chloroform in such cases, of course, is not to supersede other means usually had recourse to, such as delivery, &c.

In cases of severe agony, and jaundice attending the passage of *gall-stones*, the inhalation of a drachm or two of chloroform will often act like a sudden charm in affording relief from pain and spasm. It is probable here, that there is produced a relaxation of the ductus choledicus, and associated muscular or nervous fibres of the adjacent diaphragm, duodenum, abdominal muscles, &c., all thrown into spasm by an irritating calculus; it is curious, too, that jaundice has been occasionally produced by chloroform, especially when

given in small or irritant doses; but this is a much more rare phenomenon than the cure of jaundice by it.

A case of the following kind has come under notice:—A gentleman in the higher circles of society, an old gentleman subject to bad attacks of jaundice and gall-stone, in the country, was supposed to be at the point of death from "black jaundice" and impacted gall-stones; an entire week of horrible agony had passed; warm baths, blisters, purgatives, globulistic remedies, ipecacuanha, and every other conceivable remedy had been tried in vain. Opium had made things worse, and emetics no better; a fair trial, in one word, was given, or supposed to be given, to the good old classic abracadabra of Copeland and Watson, that

"Old Experience which doth attain
To something of prophetic strain."

Experience of all kinds had been summoned from the nearest country town; but, with amiable suavity, Old Experience had pronounced the case incurable; it had been well excogitated that the bile secreted by the hepatic cells had probably regurgitated along the cystic duct into the gall-bladder; there stored up it became concentrated; how cholestrine (not Dr. Thudicum's blood corpuscles) had formed a calculus, with much more, all pointing to sadly established organic disease of the worst kind. In this emergency, as a matter of "ridiculous form," as it was said by Old Experience, a young but eminent city physician was summoned by telegraph—a man of the new school, eclectic and sensible, who are glad to accept remedies from whatever side of the compass they come.

"Have you tried chloroform?" he ventured to ask in consultation. "Nothing like leather—of course not; but perhaps you would like to do so!" To which he replied in the affirmative.

A few drops of chloroform, in fine, were tried, with the best possible result; the agony of the gall-stone yielded as if by some potent spell, the simple *rationale* of the cure being that it relaxed the muscular fibres, perhaps of the pylorus and duodenum, the gall-ducts, diaphragm, &c., and allowed the gall-stone to pass, whereas, previous purgatives, blisters, opium, &c., had only tended to derange the healthy sympathy which usually exists between the mucous membrane of the duodenum and the bile passages. In a sad case of this kind, not very long ago, it will be remembered, one of our most eminent members of Parliament died of the agony of gall-stones, and the derangement brought on by large doses of opium; it is probable one drachm of chloroform would have saved his life.

In some of the worst sufferings of uncomplicated asthma and in hooping-cough I have known the inhalation of chloroform to prove very beneficial: indeed it is clear that the often vaunted popular cures of hooping-cough, by children inhaling the vapour at gas works, is easily and only to be explained by the calming influence on the glottis of some of the many gaseous carbohydrogens belonging to coal-gas, so like chloroform. I have known also the popular specific, or liniment of oil of amber, camphor, &c., for hooping-cough, to prove far more useful when chloroform and ether were added to the formula—the liniment rubbed to the chest and neck, rather than in the time-honoured method, to the spine of the child. If hooping-cough (as it often is) happens to be mixed up with bronchitis, or if asthma be associated with emphysema, the chloroform will cause disappointment if it does not aggravate matters. A little antimony for the bronchitis may, however, be combined with the inhalation method, and will never disappoint in the bronchitis of children; the direct application of solution of nitrate of silver to the glottis, in hooping-cough, is also facilitated by the use of chloroform.

Again, in various forms of epilepsy, though theory at first contraindicated the administration of anæsthetics, subsequent experience has fully established the fact, that, contrary to presupposed views, chloroform in full doses controls the epileptic fit; and while good breathing is kept up there is no cause of apnœa, or alarm from suffocation. It is, however, as an auxiliary—in allowing a full examination as to the peripheral origin of the epilepsy, and surgical interference, by caustic or knife, leading to the cure of hun-

dreds of such cases—that chloroform has remodelled the entire practice of epileptic diseases; the mechanism of the epileptic fit has now been so well explained by Brown-Séquard, Reynolds, and others, and the fit itself so often found to depend on external or peripheral sources; for instance, irritation of bad teeth, worms, external excitement of the genito-urinary organs, that a trial of chloroform, especially in female epileptics, seldom fails to yield suggestive results. Chloroform, on the other hand, is of less value (if not attended with positive risk) in hysteria and chorea; it is also of questionable safety in the debility of delirium tremens and puerperal mania, but in the other affections detailed—convulsions, asthma, hooping cough, gall-stones, obstetric practice generally, and many other purely medical cases—it will seldom fail to give most beneficial results.

In these observations I have not dwelt on the use of chloroform, except by inhalation. Every one, however, now knows the great usefulness of "chlorodyne" in all the several varieties of which Roscoe and others have shown that chloroform is the active agent, though at first denied.—*Dublin Quarterly Journal, Aug.* 1866, *p.* 83.

77.—SURGICAL USES OF LIQUID GLASS.

This is a silicate of potash, which is soluble in hot water, but insoluble in cold. It has been used for rendering structures incombustible, for protecting against moisture, &c., and the late Professor Schuh, of Vienna, employed it in surgery, and made a communication on the subject to the Medical Society of that city. He first used it in a case of arthritis of the elbow-joint. The solution is applied by means of a brush over the ordinary bandages. The advantages which this application is said to possess are the following. 1. It is simple, and easy of application. 2. It dries and hardens rapidly, requiring for this purpose only five or six hours. Desiccation may be favoured by using a solution evaporated to the consistence of a syrup. 3. It is very solid and impermeable. 4. It is readily removable by means of hot water. 5. It is very economical. Before putting on the bandages, a layer of liquid glass may be applied over the limb. At the Venice General Hospital, Dr. Minich has used the liquid glass with great advantage, in three cases of coxalgia, in seven cases of fracture, and in three cases of disease of the knee-joint. He has found it to possess superior advantages as regards solidity and durability. Plaster of Paris becomes sooner hardened, but is very heavy in comparison with the silicate of potash.—*British Medical Journal, May* 19, 1866, *p.* 525.

78.—CASES TREATED BY ACONITE INTERNALLY.

Under the care of Dr. Prosser James, at the City Dispensary.

Case 1.—A boy, æt. 13, seized with febrile symptoms on Monday; admitted the following Wednesday, complaining of sore throat and feverishness. Skin hot and dry; tonsils large and tender,; whole fauces intensely congested; tongue "strawberry;" pulse full, 120; cough. Tinct. aconiti ℥vj.; aq. ℥iij. M. Sumat. 3ij. 3tia quâque horâ. On his next visit he was much better in every respect. The pulse had fallen to 98. One week after he commenced the treatment was discharged cured.

Case 2.—John B., æt. 35, after exposure to cold and wet, was seized with shivering, followed by heat of skin. On second day of illness was admitted with fever and sore throat. Voice reduced to a whisper; tenderness on touching the thyroid cartilage; fauces fiery red; tonsils somewhat swollen; with laryngoscope redness seen stretching down the larynx to vocal cords; epiglottis swollen and congested; pulse 110, full. Two drops of tincture of aconite (P. Lond.) to be mixed with a little powdered sugar and laid on the tongue every three hours. After eight doses, complained of tingling all over. Congestion of throat nearly gone; voice better, but hoarse; skin cool and

comfortable; pulse 80, small, compressible. Omit the medicine. The third day discharged cured.

Case 3.—Thomas ——, æt. 20, usual health good; states he has caught cold; on admission is very hoarse; has redness of fauces; tenderness over thyroid, and congestion of larynx on inspection by laryngoscope; skin hot and dry; thirst; pulse 95, full and hard. Three drops of the tincture mixed with sugar placed in his mouth. Numbness soon supervened; then a sensation of "pins-and-needles" all over him. About four or five hours later applied again, being frightened by these symptoms, besides a constant desire to swallow and fits of suffocative cough. On inspection the injection had gone, the velum lay loosely on the tongue, as though it were paralyzed—accounting for the desire to swallow and the cough. Pulse soft, 72. To take no medicine, but gargle the throat now and then with pure water. Next day all his symptoms had disappeared.

Case 4.—Henry ——, æt. 53, admitted November 1st, having been ill a week with pain in the side, cough, and expectoration. The pain is dull, and continued all over right side. Breathing very short and laboured; pulse full, 120; tongue furred; bowels open; expectoration "like white of egg," once a little rusty-coloured. On percussion and auscultation there is dulness and crepitus all over right back. Tinct. aconiti ♏xv.; aq. ℥xij. M. ℥j. 4ta quâque horâ.

Nov. 5th. Pulse much less full, only 86; all below the level of right nipple tubular breathing, with here and there points of crepitation. The whole inferior half of right back presents also tubular breathing and bronchophony. Cough troublesome; expectoration quite white. Continue the medicine.

8th. Pulse 80, soft and compressible; otherwise much the same; feels some numbness in his fingers. ℞. Pil. conii comp. gr. v. ter die sum.

12th. There is some increase of voice-sound over the right back, but no moist râles can now be heard; the numbness has not nearly gone from his two middle fingers; the cough is slight and easy; skin cool; no pain; all functions comfortably performed; was desirous of being discharged; was therefore discharged, with a few more pills, and directions to take care of himself.

Remarks.—These cases illustrate very well the practice of Dr. P. James in the internal use of aconite. He has employed it in several thousand cases of various diseases—mostly those in which there is increase of the heart's action. He employs it frequently as a febrifuge instead of salines, attributing to it the power of reducing the pulse and relieving the whole train of febrile symptoms. It is particularly useful as possessing certain anodyne qualities. There are few diseases in which the experiment has not been made. All cases characterized by nervous excitement seem to be benefited. Many forms of palpitation are at once cured. Dr. J. has frequently used it in organic cardiac diseases. In his practice aconite takes the place of digitalis as a controller of the circulation, in addition to the place of salines as febrifuges. The sensation of "pins-and-needles" shows that the drug is acting on the system, and on the appearance of this symptom it should be discontinued or the dose diminished. It is to aconite what salivation is to mercury, or muscular twitchings to strychnine. Its powerful action on the heart is shown by the rapid fall of the pulse in each of the cases reported above. Its local action on the fauces is well seen in Case 3, while in Cases 2, 3, and 4 the numbness was produced by a few doses.—*Medical Press and Circular*, *Aug.* 2, 1866, *p.* 121.

79.—ON THE TREATMENT OF ACUTE RHEUMATISM BY PERMANGANATE OF POTASH.

By Dr. James F. Duncan, Physician to the Adelaide Hospital.

[The following is an extract from a clinical lecture delivered at the Adelaide Hospital.]

In my last lecture I explained to you the views that I have been led to form of the nature of gout. I told you that I considered it depended upon imper-

fect oxidation of the albuminous constituents of the blood arising from impaired nervous energy. That these constituents, when about to be eliminated from the system underwent a metamorphosis, first into lithic acid, and subsequently into urea by combination with oxygen in different proportions, and that when the process was arrested in its course, lithic acid accumulated in the circulation in the form of lithate of soda, and gave rise to the peculiar symptoms which constitute the gouty paroxysm. I further mentioned the connexion which I believe exists between this imperfect oxidation of the nitrogenous compounds and impaired assimilation in the digestive system—a connection which has induced me to resort to the use of hydrochloric acid in the treatment of the disease, and as you may have yourselves observed, on several occasions with very decided benefit.

I proceed to-day to speak of the kindred affection, acute rheumatism, which presents many points of resemblance to gout, but which appears entirely different in its nature, to affect a different class of persons, and to require a different plan of treatment. This disease, as well as the former, seems to depend upon imperfect oxidation of the blood, but the particular constituents which are implicated in the two diseases are perfectly distinct. In gout it is the nitrogenous compounds, in acute rheumatism it is the non-nitrogenous or starchy. These latter seem naturally to pass through the several stages of conversion into sugar, lactic acid, and carbonic acid—changes which depend entirely upon the increasing amount of oxygen which enters into combination with the original hydrocarbon. When the last stage, that of carbonic acid, has been reached, the transmuted starch, having fulfilled its office in the economy, passes off from the lungs in the act of respiration. I need scarcely remind you that while the nitrogenous articles of food are supposed to contribute to the support of the animal tissues, the carboniferous are believed to be principally engaged in maintaining combustion. It needs no argument to prove that if the series of changes I have detailed do not proceed through their entire course, the imperfectly oxidized products, whether in the form of sugar or of lactic acid, must accumulate in the blood and give rise to disease, constituting in one case diabetes, and in the other rheumatic fever. That lactic acid, when in excess, is capable of producing all the phenomena of acute rheumatism, including the endocardial deposits on the valves of the heart, has been shown by Dr. Richardson, of London, so that no reasonable doubt can remain as to the efficient and proximate cause of the affection; and as I have attempted to show that the imperfect oxidation of the nitrogenous compounds in gout is due to impaired nervous energy, which fails from this circumstance to carry out to completion the chemical changes that take place in health, there is reason to believe that the imperfect oxidation that occurs in acute rheumatism is due to a similar cause, but arising under different circumstances and in a different manner. Rheumatism can generally be traced to an attack of cold disturbing the functions of the body generally, and producing well-marked fever. It would not be difficult to show, from the way in which the various functions are affected, the arrest of the secretions, the change in the temperature of the body, &c., how deeply the nervous system is involved in this state and how much its energy must be depressed.

The view just presented of these two diseases appears to me to be both interesting and important, and sufficient to account for many of the differences which are known to exist between them. For example, while the one prevails chiefly amongst the upper class of society, because of the abundance of the nitrogenous compounds contained in animal food of which they partake largely, the other is common among the poor, whose diet consists, to a great extent, of vegetable matter, and while gout is a disease of mature life and even of old age, rheumatism occurs at all ages, not excepting the very young, because all are equally liable to suffer from cold and wet, whereas a long course of indulgence of the appetite seems generally necessary to pave the way for the development of gout.

It may perhaps seem strange that if the views here propounded have any foundation in fact, that the matter has not ere this been made the subject of scientific experiment and reduced to demonstration. But the fact is, that with

all our boasted progress of late years, the attempt to penetrate the mysteries of nature is not so easily to be accomplished. Every one acquainted with organic chemistry must be aware of the extreme difficulty of determining the precise constitution of complex substances of this class as compared with those of an inorganic nature. Many different organic compounds have yet the same molecular constitution so far as the number of their constituent atoms is concerned, yet owing to differences in the manner in which these atoms are arranged among themselves, their peculiar properties are totally unlike; and different analysts, arranging the constituent elements of these substances according to their individual views, will give a different account of their respective constitutions. This difficulty becomes still more remarkable when the subject of our inquiry is a living body and embraces the consideration of vital energy present in the body to be examined and influencing the result. You are all, I dare say, familiar with Claude Bernard's investigations regarding the liver. He first thought that the liver possessed a power of producing sugar out of the blood in its progress to the lungs, and that the sugar thus formed was burnt off in the act of respiration, so that no trace of it could be found in the left ventricle of the heart. He subsequently modified this opinion, so far as to believe that there was in the liver itself a peculiar substance which he named glucogene which had the effect of changing by contact the starchy elements of the blood into dextrine or grape sugar; but the late researches of Dr. Pavy, repeated and confirmed by Dr. Robert Macdonnell of this city, have shown incontestably that what Bernard considered was the natural and normal condition of the liver, was really a post-mortem effect occurring almost at the instant of death, and in all probability the result of the cessation of the energy of life. I mention this to show not only the extreme difficulty of determining questions of this kind, but the strong colour of probability that it gives to the hypothesis which I have here propounded, for if the formation of dextrine be kept in check by the vital force so long as that force is maintained in its full vigour, and if, as appears by these experiments, sugar may be detected in notable quantity in a remarkably short space of time after an animal has been killed, so short in fact as merely to allow of preparations being made for carrying on the investigation, it is extremely probable that anything which materially weakens the nervous energy must favour the production of this very substance which is the preliminary step to the formation of lactic acid, and which, unless carried forward to the further development of carbonic acid, must lead to acute rheumatism.

Not that you are to suppose that the correctness of these views is dependent in any sense upon the sugar-producing power of the liver being sustained by the further light which physiology may throw upon this subject. The remarkable point of his investigations was, his showing that the liver could form sugar out of nitrogenous substances—materials naturally unsuitable for the purpose. But I need scarcely tell you that the more obvious sources of sugar—the articles containing starch which are used as food—find their way into the circulation without passing through the vena portæ at all, and consequently without traversing the liver. In whatever way, however, they may be introduced into the blood, they seem to have this useful purpose to serve in the economy, to support the changes occurring in respiration, and to require to be formed into carbonic acid in order to be eliminated from the system.

Let me now very briefly attempt to apply this view of the nature of acute rheumatism to the question of its proper treatment. Setting aside what may be regarded as the treatment of collateral symptoms by special remedies, such as the abatement of pain by the use of narcotics, the plans in ordinary use for the cure of the disorder may be classed under the heads of the antiphlogistic, including bleeding, purgatives, and mercury; the tonic, including the administration of bark, nourishment, and stimulants; the alkaline, including the alkaline carbonates, intended to neutralize the lactic acid; and lastly, agents which contain oxygen in large quantity, and which may be supposed to part with this principle to promote the complete transformation of the lactic acid into carbonic acid. Each of these plans of treatment has

its advocates, and no doubt peculiar circumstances in individual cases may render one plan suitable to one case and another to a different one. I am by no means disposed to recommend a routine treatment to any form of disease; on the contrary, I would myself adopt the eclectic plan, and strenuously advise you to do the same. My purpose at present is only to speak very briefly of the last of these plans, which embraces the administration of nitre, of citric acid, and of the remedy you have seen me using of late—the permanganate of potash—a remedy which I am not aware has ever been tried in this disease before, but which I was induced to resort to from a consideration of its chemical constitution. All these substances contain oxygen in large quantity, but the peculiarity of the permanganate is this, that it holds this element in a very loose affinity; so loose, in fact, that it is almost impossible to combine it advantageously with any other substance, as it undergoes decomposition and becomes practically inert. The effects we have seen it produce for so far are these: it cleans the tongue, relieves pain, acts slightly on the bowels, and removes turbidity and fœtor from the urine where they have existed. The only drawback to its use has been that several patients have complained of its unpleasant taste. The form in which it has been given has been that of solution of Condy's disinfectant fluid in the proportion of one part to seven of distilled water. Half an ounce of this mixture every second hour for a dose. The strength of this preparation, as given by Neligan, is 9·26 grains to the ounce, while the ordinary solution of the Pharmacopœia is only four grains to the ounce. In classing nitrate of potash among the oxidizing agents, I know that many persons will object to the view thus suggested of its *modus operandi* and maintain that its beneficial effects are solely due to its property of increasing the secretions from the skin and kidneys; but I think it is not unreasonable to suppose that among the various chemical changes that take place during its action, some portion of it may be decomposed, to answer the purpose in question. Nitrate of potash, however useful in some cases, from its depressing influence on the circulation, is not suited in my judgment to any instances when the vitality is not vigorous. Lemon-juice is, I need scarcely tell you, both palatable and safe, but is occasionally apt to act on the bowels, as happened in one case, for which reason it had to be laid aside after having given temporary relief.—*Medical Press and Circular, May* 16, 1866, *p.* 501.

80.—DENTAL INSULATOR FOR ANÆSTHETIC OPERATIONS.

By Francis McLean, Esq., Dental Surgeon to the City of Dublin Hospital, &c.

Some months since, when the anæsthetic spray producer was on its trial, it was reported to be most successful in all minor surgical operations, excepting the extraction of teeth, in which most painful one its efficiency was only doubtful. I then laid before the readers of the "Medical Press and Circular," in its issue for March 14, 1866, the result of my experiments with it in dental operations, and I arrived at the conclusion "that the anæsthetic effect is complete whenever the spray can be properly applied." In its application I found a number of difficulties to contend with, but the greatest was to prevent the tongue and cheek from interfering with the ether spray when applying it to the teeth in the lower jaw. With a view to obviate this difficulty, I have contrived an instrument which can be easily used without the assistance of a third party—which will expose an uninterrupted view of the tooth to be extracted, and of the parts necessary for the spray to play on—very simple in its construction, and can be held in the mouth lightly by one hand of the operator, while his other is engaged directing the ether jet.

The instrument, manufactured of silver, consists of two valves, curved so as to give a sufficient space round the teeth to which they may be applied for the introduction of the double jet, and hinged to each other, to allow them to adapt themselves closely to the lower part of the jaw. To the inside

is attached a plate for depressing the tongue, which it effects without controlling its movements or causing the unpleasant sense of sickening which the use of the spatula is subject to. To this depressing plate is attached the handle movable on a pivot, so as to allow of its being drawn to one side. When the instrument is placed *in situ*, it perfectly protects the tongue and cheek from the ether, the two valves being pressed together by the parts, fit closely to the gum covering the lower part of the alveolar process, while the tooth and its surrounding parts are seen in the centre perfectly insulated.

The patient, keeping the mouth well open so as to allow the ether to evaporate quickly, can at the same time work the hand-ball bellows as the operator may direct. The moment the parts become blanched, the surgeon dexterously withdraws all, and without delay extracts the tooth, which I have no hesitation in saying can be done painlessly in a large majority of cases, *provided you use anhydrous ether with Richardson's double spray producer in proper working order*. Too much attention cannot be given to these requirements, for in cases in which I have seen the apparatus fail, and so fall into disrepute, the causes have been its not working properly, and the impurity of the ether used. With regard to the objection of the ether entering the throat and tickling the fauces for a few seconds which the application requires, this can be avoided by protecting it with a napkin, and requiring the patient to breathe through the nose.

This instrument, to which I have given the name Dental Insulator, I place before the profession as the result of my exertions to facilitate the use of local anæsthesia in dental operations, not doing so, however, without fully testing its efficacy. Having done so, I feel satisfied that by its aid we shall have more success in operating on the teeth of the lower jaw than has hitherto been experienced.—*Medical Press and Circular, July* 11, 1866, *p* 34.

81.—TOOTH CEMENT (STEHLE).

Gutta percha, 5 parts; white wax, 1 part; oil of cloves, a few drops. (*Wittstein's Vierteljahresschrift f. Pharmacie*, p. 2, xiv.) Another (Sorel):—A light oxide of zinc is prepared by moistening the ordinary oxide with nitric acid, and then igniting it. Thus prepared, it is made into a soft paste with a solution of chloride of zinc, having a specific gravity 1·9 or 2·0. This soft mass speedily acquires great hardness, which it permanently preserves. If a grey colour is required, the least trace of carbon may be used, got by holding the pestle with which the paste is made over the gas for a moment. A trace of sulphide of cadmium will produce a yellow tint.—*Year Book of Pharmacy.—Medical Press and Circular, May* 9, 1866, *p*. 494.

82.—ON ELECTRO-THERAPEUTICS.

By Harry Lobb, Esq.

Static Electricity.—Static electricity is a force manifesting itself through the agency of matter by attractions and repulsions, and these are its most important conditions in the inorganic kingdom; but when we come to study it in vitalized bodies, we find that it undergoes a new series of changes, differing in their characteristics from what we have been led to anticipate by its phenomena in the inorganic kingdom.

I must, however, before passing on to the more important field of dynamic electricity, give you some idea of static electricity; but I shall not detain you long on this subject.

The theory, explaining the various electrical phenomena which is now most in favour, is that of Symner. He assumes that all matter has associated with it a certain quantity of a subtle imponderable fluid, made up of two separate conditions of the same fluid, so that in combination they neutralize one another; but when, by the action of some force, they become separated,

the one is termed positive or vitreous electricity, the other negative or resinous. This is a pure hypothesis, and really means nothing, but affords a simple method of explaining many electrical phenomena.

Now we have the means of detecting the presence of one or other of these electrical "fluids" by an instrument termed an electroscope; here is one termed *Volta's condensing electroscope.* You will perceive that there are two pieces of gold-leaf hanging from the lower brass plate, the electricity is in a neutral condition; and the gold leaves are consequently at rest; but we have the power of detecting very small quantities of free electricity with this apparatus. Suppose we wish to detect the presence of free negative electricity in a piece of sealing-wax; we place it, after having rubbed it, in contact with the lower or collecting plate.

The upper or condensing plate is connected with the earth, by touching with the finger, and the plate is electrified positively, in contradistinction to the lower plate, which is electrified negatively by means of the wax; but the leaves do not sensibly diverge, as the opposite electrical fluids attract one another, and thus become located almost exclusively on the two plates. If the upper plate be now removed, and with it the source of the positive electricity, the negative electricity freely passes to the leaves; and being both negatively electrified, they repel one another and fly apart. Now, after a time, the leaves fall together again from the negative electricity on the leaves combining with the positive electricity in the air: if the air is very dry, this takes place slowly; if moist, rapidly.

This will give you some idea of static electricity, in reference to its combined or neutral state, and its decomposed or active condition.

The states of attraction and repulsion are the most important features of static electricity; but only secondary to these is the inductive state, which electricity has the power of setting up in other bodies at a distance. Our great Faraday considers this power of inducing an opposite state of electricity in matter in a neutral state, by the action of an electrified body in its neighbourhood, to take place through the surrounding medium, which must be, to a certain degree, non-conducting; thus, in air, the atom in juxtaposition to the electrified body by the inductive power of that body is polarized, the contrary electrical state is induced in the adjacent portion, and the like state is induced in the further portion of the atom; and in like manner from atom to atom, until the neighbouring body is reached, which is consequently in an opposite electrical condition to the inducing body. Now, this induced state can only take place if the bodies are at a certain distance, and the quantity of electricity in the electrified bodies of a certain amount: for upon the bodies being made to approach each other, coming within a certain distance so that the attraction of the two electrical conditions overcomes the resistance of the medium, the electricities fly together, and equilibrium is established; or again, if the quantity of electricity in the electrified body is increased, it will at length overcome the resistance of the medium, and again equilibrium will be re-established by combination.

This leads us naturally to the subject of *tension*, which may be defined as the desire of the accumulated electricity to combine, by overcoming the obstacles offered by the medium.

Static electricity is chiefly induced by friction; it accumulates on the surface of bodies, and manifests its presence by attractions and repulsions.

And here I shall dismiss static electricity, for we shall have very little further necessity to touch upon this agent, as I shall be able to prove to you that we have a much more valuable agent in dynamic electricity for the treatment of disease.—*Medical Press and Circular, June* 13, 1866, *p.* 619.

83.—THE MUTUALLY ANTIDOTAL PROPERTIES OF OPIUM AND BELLADONNA.

By Dr. Henry S. Downs, of New York.

This is the subject of a paper by Dr. Downs, published in the Transactions of the State Society of last year. *Eleven* cases are detailed, of which we give a synopsis.

Case 1.—Infant, three and a half months old, had been given about one teaspoonful and a half of a preparation of paregoric nearly one-half stronger than the tinct. opii camph., U. S. P. Narcotism, deglutition difficult, pupils contracted to the size of a small pin's head. Child was only kept aroused from stupor by severe and continued agitation. About six hours after the administration of the dose, ten drops of tinct. belladonna were given, and repeated at intervals of fifteen minutes until forty drops were given, when the pupils were dilated to double, and in one hour to treble the former size. Improvement rapidly followed. (Dr. Downs.)

Case 2.—Woman, æt. 35, had taken one-half ounce of laudanum suicidally. Seen an hour later, partially sensible. *No* emesis could be induced by ipecacuanha, sulphate of zinc, tartar emetic, or mustard. She became insensible, pupils contracted to the size of a pin's point; profound stupor, from which she could not be roused. One drachm of tinct. of belladonna was then given, followed by two grains of the best English extract of belladonna every twenty minutes, until six grains were taken. Soon after the third dose the patient vomited, the ejecta smelling strongly of opium. Sensibility gradually returned, and at the end of eight hours pupils were natural, sight restored, and consciousness complete. (Mr. Loines and Dr. Jones.)

Case 3.—Woman, had taken one and a half ounces of laudanum. All the symptoms of opium poisoning present. Emetic first, then a reliable tincture of belladonna, thirty drops every half hour, until ninety drops were taken. Rapid recovery and no indications of her having taken belladonna. (Dr. Wm. H. Thompson.)

Case 4.—Soldier, took two ounces of laudanum and smoked one grain of opium. Three hours afterwards was found comatose, pupils contracted, and slightly spasmodic. Forty drops of tinct. belladonna were given at half-hour intervals, until he had taken 120 drops, and then in half an hour twenty drops more, when he began to improve, and entirely recovered in a few hours, with no signs of having taken belladonna remaining. (Same authority.)

Case 5.—Soldier, took over an ounce of laudanum. About an hour afterwards drowsy, face flushed, pulse low, pupils much contracted, hands twitching, tendency to convulsions. One grain of extract of belladonna every half hour until three grains had been given. Two hours after first dose of belladonna, the pupils had dilated, pulse and skin natural, and able shortly after to go on duty. (Dr. Charles D. Hackley.)

Case 6.—Infant, eight weeks old, had been fed on Mrs. Winslow's soothing syrup until complete recovery was impossible, even by the aid of belladonna. (Dr. C. C. Terry.)

Case 7.—Belladonna poisoning occurred in a young woman who used belladonna pessaries for the purpose of allaying the excruciating pains of ovarian dysmenorrhœa. The toxical effects were suddenly developed to delirium. One and a half grains of Magendie's sol. sulph. morphia entirely removed the symptoms of poisoning an hour after delirium appeared. (Same authority.)

Case 8.—Belladonna poisoning from use of belladonna pessaries. Opium used with same good result. (Same authority.)

Case 9.—Child, through mistake, took one teaspoonful of laudanum. An hour later comatose and incapable of being roused. Ten drops of tinct. belladonna every hour until sixty drops were taken, when narcotism subsided and the patient slowly but gradually recovered. (Dr. J. P. Garrish.)

Case 10.—Man, took one ounce of laudanum. When seen, two hours

later, feeble pulse, contracted pupils, stertorous breathing, and could not be aroused. Emetic first, and twenty drops tinct. belladonna every hour until about ninety drops were taken, when he began to show signs of consciousness, and by the aid of coffee, stimulants, and the cold douche, was gradually restored. (Dr. Garrish.)

Case 11.—Woman, took ten grains of opium. In one hour was found in a semi-comatose state, pupils contracted. Emetic, then twenty drops of tinct. belladonna every hour until sixty drops were taken, when consciousness began to return, and she recovered.—*Philadelphia Medical Reporter.*—*Medical Press and Circular, April* 11, 1866, *p.* 369.

84.—CHLOROFORM IN DYING.

By Dr. Joseph Buller, Physician to the Royal South Hants Infirmary.

So many cases where most attention is expected, are those where disease can only be palliated, that palliation becomes a very important part of our duties. Few of this large class are more distressing, than when extreme restlessness and sleeplessness accompany the exhaustion of the last days or weeks of the life of the very aged, especially when (as is often the case) the mental consciousness is still active, and the failure of power in the vital organs is actually felt, with none of that physical courage to bear the suffering, which the same patients had when younger and stronger. That true health, or at least that tenacity of life on which its long duration depended, keeps them alive and suffering, and conscious of this suffering, for a length of time tedious to themselves and often most wearisome to those who watch over them, and who look (so often in vain) to medical aid for an alleviation which would relieve themselves as well as the patient.

Small opiates, which at an earlier stage may have been useful, at this later one often aggravate the distress instead of soothing it; and it is in this condition that the cautious inhalation of chloroform is a great boon.

A lady, aged 82, had been for some years confined to her bed and sofa, and, without any appreciable bodily disease, was now gradually sinking. For some years she had suffered mentally from depression taking a religious form as to her soul's safety, and so persistently that it seemed like a delusion, from the powers of the brain becoming enfeebled. But she had a good appetite; could employ herself much with finger-work; and, though confined to her room, and much in bed, had a very fair amount of bodily health. Some months before her death, the delusions were attended with more excitement and irritability; she slept less, and often not at all; and her appetite gradually declined. Small doses of liquor opii sedativus (from five to ten drops) at night soothed her at first; but, as her strength diminished, the same doses excited her brain, and she lay in a very distressing state of restlessness and prostration, exacting constant attention from those watching her. She lost her appetite and power for solid food, and could only take small quantities of beef-tea and weak brandy and water. In this painful condition, about five weeks before her death, I recommended the inhalation of twenty drops of chloroform at a time at bedtime, on a handkerchief; having first given it to her myself, to see whether it soothed and was agreeable to her, or otherwise; and it was found that this prevented the exciting effects of the liquor opii sedativus until its narcotism exhibited itself, and by both together she had quieter nights. But, after a few days, the opiate was discontinued, as it excited, and chloroform alone used, with so pleasant a result to the patient herself, that she frequently, by a sign, indicated her wish to inhale it, and was partially for a month and wholly for five days before death kept almost constantly under its moderate influence. The effect was to quiet the delusions, to make her mind peaceful and happy, and also to raise the pulse and respiration. Her daughter observed this, and I found it to be the case. When she was so weak that the pulse could only be felt with difficulty, a short inhalation of chloroform rendered it distinctly perceptible, and the respiration became slower and more natural.

At my request, one of this patient's daughters stated in writing their observations on chloroform in their mother's case, as the inhalation was carried out by these ladies and a middle-aged sensible attendant.

"A pleasing feature in her case," writes the daughter, "was that chloroform never made her really insensible; it only lulled her pain, gently calmed her spirits, and frequently, but not always, sent her to sleep for a few minutes, when she would awake quite herself, with a perfectly natural look and manner, and perhaps ask how long she had been asleep; and this after so many months of fearful excitement. We felt nervously anxious at first of giving her too much, and we never omitted to watch the pulse. One morning, after breakfast—a time when she was generally low—I had given her the usual dose of brandy and water, when she said, 'I do not like the brandy as I did; give me some of the nice stuff to smell' (meaning chloroform). I did so with some anxiety, as she was so low, when, to my great relief, the pulse gradually rose. I continued giving small doses at short intervals, when it very soon regained its usual strength. After this, we constantly noticed the same thing; and we no longer hesitated to give her as much as she craved, especially as the breathing powers were much relieved and became more free, and the countenance took a peaceful and happy expression, such as we had rarely seen in her of late years. To our minds, this craving was an instinct of nature. She had for a long time been asking for something to smell, and nothing we could get for her seemed what she wanted; but, when she had once felt the effects of the chloroform, she never asked for anything else, but for that constantly.

"My mother used just under a quart. The greater part was given during the last week or ten days of her life; but, the night before she died, she inhaled nearly half a pint. Still she was conscious till within six or eight hours of her death; at that time, we believe she became quite insensible."

Statements of this sort by intelligent friends, who watch effects and describe them without any bias, are especially valuable.

This statement is satisfactory as to chloroform soothing the mind; for, under its mild influence, the patient was more like herself in the most tranquil periods of her life, and altogether different from that excited and restless or depressed condition which, as her bodily powers failed, added so much to her sufferings. It is also valuable in showing that, in certain weak states of body, chloroform strengthens the pulse and respiration—a fact often observed by those who watch the pulses of patients undergoing operations under chloroform. If the dying state be reckoned by the respiration becoming quicker and the pulse failing, this patient took five days in dying; and as the chloroform so obviously increased the strength of the pulse and breathing, it rather prolonged than shortened life. Indeed, it seemed to act like the tonic stimulus of food or wine in a stronger bodily condition, and at a time when neither of these could be taken.

This was one of the few cases in which (no *post-mortem* examination having been made) the only return of the cause of death I could make was the decay of old age. The lungs, heart, digestive organs, and kidneys, were without disease; and the delusions were attended with no paralysis or loss of cerebral or nerve power.

In the next case, although the patient was 75 years of age, and had been breaking for two years, he did not die of old age, but was greatly worn down by pain. He was well known in this county as a sportsman. He had hunted, shot, and fished from his youth, and still shot all the season; indeed, his last illness was brought on by exposure to cold in shooting, beginning by severe catarrh, and followed by violent pain of the left side of his face and scalp and ear. The pain resisted quinine and other neuralgic remedies, and its obstinacy was eventually explained. He had been deaf for some time; but increased deafness of the ear, with tenderness and some fulness over the mastoid process of the left temporal bone, indicated disease of the petrous portion. He was a man who had been able to bear pain unflinchingly. He was organised for a sportsman—tall, lean, muscular, no fat, large-chested, and bony. In hunting, he had at various times broken or dislocated several of

his long bones; and his brother told me he had seen seven men with pulleys trying to reduce his dislocated shoulder, whilst he uttered no complaint; and the surgeon said (in that heroic age of remedies) they could not make him faint. But this pain was so excruciating that it wore him down. It was always there, but at times in acute paroxysms. He had chronic cough and expectoration from bronchitis, and latterly passed much pus from the bladder, giving suspicion of pyæmia, with complete loss of appetite and failing strength. He could never in his whole life take opium, as it excited him; and when he had it now, it produced no relief, but distressing sensations and sickness. In this condition, and about three weeks before his death, when all hopes of his recovery had passed, I recommended him to inhale chloroform. It relieved the pain, and gave him bodily comfort. The effect, he said, was like champagne, when he could drink a bottle of it. As he became weaker, he increased the quantity of it, and kept himself much under its influence. In the last five days, sixty-three ounces of chloroform were used. He was a strong-willed man, who would do as he liked; and, having once felt the agreeable relief which chloroform gave him, he compelled his niece (who watched him) and his servant to wet his handkerchief with it as often as he called for it. It rendered his last days bearable, and indeed comfortable, instead of a period of excruciating pain. There was no *post-mortem* opportunity of seeing the disease which produced this great suffering; but, as the mastoid process was tender on pressure and swollen, and the skin somewhat red, with complete deafness, it was evidently from diseased bone. It recalled a case I saw in February, 1863, of a man who seemed literally to die of pain referred to the sacrum and coccyx, which came on after exposure to wet three months before admission into the South Hants Infirmary; and by no remedies could the pain be removed. Subcutaneous injections of morphine, chloroform, veratrine, aconitine; externally, blisters, with morphia, hot hip-baths, were thoroughly tried; externally and internally, opium, chlorodyne, cannabis indica, quinine, iodide of potash, and guaiacum. Short relief was given by relays of four leeches, but this only for a short time; and the poor fellow was actually worn down, and died from this pain. My friend, Professor Aitken, of Netley, kindly examined minutely a portion of the sacrum and coccyx I sent him, and the cause was discovered to be vascular tumours in the bony structure. He thus described them. "In both pieces of bone, after the flesh had been removed, vascular tumours are seen. One of them is nodulated, and of the circumference of a shilling; the other less. They are embedded in the spongy bone, and one at least presses upon the nerves as they make their exit through the sacral foramina. I am of opinion that more of these little tumours have existed in the substance of the sacral bones; perhaps also in the spongy parts of the vertebræ. They seem to me to be of a varicose nature, and connected with the venous system, rather than the arterial."

This case, as in the former, came on after exposure to cold. He had lived very freely, occasionally drinking very hard; and, though only sixty-two, was a worn-out man. He had Bright's kidneys.

It did not occur to me to make him inhale chloroform, as I should do now; for it was one of the most distressing diseases I ever watched, as nothing alleviated his constant pain, and (as the cause showed) nothing but such an anæsthetic as inhaled chloroform would have destroyed pain from tumours pressing on sensitive nerves amongst bone.

The only other case in which I have given chloroform to the dying was that of a lady, many years ago, who was subject to very painful attacks of gall-stones. Chloroform inhaled was the only relief. After several gall-stones had passed, at varying intervals of weeks and months, one attack came in which the pain never ceased, and she died after many days, deeply jaundiced. Her son, who was studying medicine, administered the chloroform. "It had the effect," he writes, "of very quickly lulling the pain; and the moment she was out of pain, I desisted. At such a moment, she was sometimes conscious of my presence, sometimes not. The amount of chloroform used altogether was very large indeed." I found, *post-mortem*,

a gall-stone of the size of a small marble, impacted in the common duct, two inches from the duodenum. The liver was very large and light yellow; and there was an ovarian tumour, with hair and bones in it, the pressure of which on the crural nerves during life had caused much suffering. She had been an invalid for a long time. In this case, also, when the patient had felt the relief from chloroform, she would have it given to her. I have seen one patient die from a gall-stone rupturing the duct; and the agony is such, that any amount of chloroform which gave ease would be justifiable; so would it be in cases of rupture of the stomach and intestines. But, in these cases, it must be given as long as life exists; and, when once its relief is experienced, we may be sure the patient will insist on its continuance to the fatal end.

I look back many years with regret to a night during the whole of which a lady of the most sensitive nervous organisation died in inconceivable suffering. Dr. Baillie said to her in her girlhood, "You will have a great deal to suffer in your life, my dear, but don't talk about it;" and his prescience was too true. For many years before her death, she constantly suffered abdominal pain, restlessness, and general distress; and latterly the cause of this was explained by the discovery of an abdominal tumour. This suddenly burst internally; and, after twenty-four hours of what was literally horrible torment, she died. Having watched the case for years, I knew she must die; but, from the weakness of her heart, I feared chloroform might extinguish life at once. With my present experience in chloroform, I should have given it freely, with the belief that the chances would be in favour of its rather prolonging life, which was shortened by the pain; and opium gave no relief.

The rule, in advising chloroform in these cases, is to judge by its immediate effects. In these instances, it was so agreeable, without any after discomfort, that, when once given, the patients insisted on its continuance; and this is our guide.

The inhalation had better first be tried by the medical attendant himself; twenty minims being dropped on a handkerchief, and held before the mouth and nose at such a distance as to admit air, but not far off; and the patient directed to breathe naturally. If it irritate or nauseate, or be in any way repugnant, these are probably unfit cases. If it soothe, and the patient ask for it again, it may be very safely entrusted to a careful nurse or female member of the family, giving clear directions that at first no more than twenty minims should be poured on a handkerchief at a time, and held at a certain distance; and that the breathing and pulse should be watched. A second supply should not be used, if the first has produced its soothing effect.

There is one question which must not be avoided, and that is the ethical one.

It is reported that Queen Maria Theresa said, in dying, "Give me no opiates; I would meet my God awake." And we meet with similar instances, where the patient sometimes, and more often his friends, think it is wrong, in a religious point of view, to give narcotics in dying. But it is not recommended for these "great hearts" to use chloroform, but for the weak ones, who suffer so terribly from the mental and bodily exhaustion of dying. The best answer to those who doubt its propriety on religious grounds, is in these letters from the relatives of two of these patients. One writes:

"For my mother, chloroform seemed to clear her intellect, and enabled her to speak with thankfulness and hope regarding her eternal interests, as she had not done for so long; and I cannot but think that more precise knowledge of its effects in individual cases would dissipate those anxious thoughts of friends on this, as on other points, to the benefit of all concerned."

The next letter is from the lady who watched the patient, to her father.

"I am quite aware of your dislike to anything like a sedative being used when a human being is passing from time to eternity. The free use of chloroform in my uncle's case was unavoidable. After once inhaling it, he would have it. But, had it been denied him in his last hours, the agony which he was suffering was so excruciating that consciousness as to everything but that, was gone. Chloroform stupifies for the time; but when its effects are past, the faculties are alive again, and the person able to attend to

other things. Were I in attendance upon a dying person, I should prefer his having temporary relief from pain; as, if he had not, he would not, humanly speaking, be more able to attend to the things which concern his soul's salvation, than if he had not obtained relief from chloroform; or I would rather say, not so capable."

These letters are satisfactory answers to those who, in ease themselves, theoretically object to soothing others in the saddest form of distress; for they show that chloroform thus administered, by relieving restlessness and pain, renders the patient, in intervals of ease, more capable of normal thought and feeling.—*British Medical Journal, July* 7, 1866, *p.* 10.

85.—BELL'S PARALYSIS OF THE PORTIO DURA.

[The following case was treated at Sir Patrick Dun's Hospital, Dublin, by Professor Aquilla Smith, with a view to show the special therapeutic action of a single remedy. The patient was twenty-five years of age, and paralysis of the left portio dura had resulted from exposure to a cold dry wind.]

Appearance on admission.—There is the usual difference between the expression at the two sides of the face when the muscles are attempted to be brought into action, but not otherwise.

The mouth is drawn to the right side. The tongue is protruded to the same side; but there is neither numbness nor loss of taste. When he shuts his mouth and puffs out his cheek, the left cheek is more protuberant than the right. His speech is slightly affected. With regard to the liquids, especially the letter "M," he himself says that this difficulty was more marked a few days ago, particularly as to the word "improvement." As is usual, he can neither whistle, purse up his lips, nor spit out; neither can he raise transverse or vertical wrinkles on the forehead of the affected side. He also manifests inability to complete closure of the left eyelids. The sensibility to touch, when pinched, was found unimpaired.

February 20th. *Treatment.*—Local electrilisation with the induced current resorted to. Wet sponges, and also pointed metallic conductors, severally employed. The sensibility was found to be a little impaired; but there was no pain felt. The orbicularis palpebrarum muscle readily responded to the electric stimulus, and, after the application of the remedy, he was able to cover the eyeball with the lids, though previously unable to do so.

21st. He can now cause the lids to meet over the eyeball, and thinks there is some improvement in eating.

Treatment.—Electricity again applied by wet sponges, and this time also with marked effect, especially on the buccinator, orbicularis palpebrarum, corrugator, and occipito-frontalis muscles.

22nd. He now closes the lids perfectly; he can eat much better; and can wrinkle the left side of the forehead a little.

23rd. Marked improvement in the power of wrinkling the forehead; he now feels twitchings in the orbicularis palpebrarum.

24th. Improving in every way.

26th. Steady improvement; he can now move the mouth a little towards the affected side.

28th. Scarcely any distortion visible; when the muscles are brought into action he can almost whistle; the natural wrinkles are reappearing on the left side of the forehead.

March 2nd. The transverse wrinkles on the forehead are now well marked; the buccinator muscle is notably recovering its power. It is expected that this man will be discharged from hospital in a few days; and Dr. Smith looks on it as a striking instance of the curative effect of electricity independently of any other means.—*Medical Press and Circular, March* 1, 1866, *p.* 222.

86.—ON FEEDING BY THE VEINS.

By Dr. B. W. Richardson.

[At the meeting of the British Medical Association, at Chester, Dr. Richardson exhibited an instrument which he has invented for the transfusion of liquid into the veins. This liquid he proposes should be a solution of albumen, subjected for a long time to a degree of heat below the point of coagulation. Dr. Richardson believes that digestion in the stomach is to albumen simply the exposure to a certain degree of heat. It is almost impossible to obtain blood from human subjects. This plan has been tried in many cases of cholera with great success. Dr. Sibson said that "he joined the association in an admiration which he could not quite express, for the beauty, simplicity, and exceeding delicacy of the apparatus invented by Dr. Richardson." Dr. Richardson said:]

A patient had been kept alive three days by injection; but she died from the continued discharge. They wanted a fluid that would sustain the patient. As to albumen, it was either poisonous or nutritious. When raw, it did not mingle with the blood; and it had the same effect as scarlatina on the kidneys. A donkey, upon which he had tried it, died with the same symptoms as in albuminuria. But since then he had found that, by subjecting it for a long time to heat beneath the point of coagulation, none of those symptoms were produced. He believed that the digestion in the stomach was, to albumen, simply exposure to a certain degree of heat. The subject was so profoundly grand in its relation to both physiology and pathology, that he would not venture to say more; but during the year, he hoped, a very great advance would be made in this direction.—*British Medical Journal, Aug.* 25, 1866, *p.* 232.

87.—AËROZOIDS.

Mr. Glaisher's "blue mist" seems likely to stir up a lively discussion as to its nature, and several suggestions of a totally different kind in reference to its cause have already been made. As its dependence upon the presence in the atmosphere to an unusual extent of minute vegetable germs has been hinted, it may be as well to point out that the spores of fungi are probably always present to a greater or less extent in the air, especially at this time of year. Spores and sporules are essentially ubiquitous, being readily carried by the wind, and transported from the spots where they are originally produced. Though they exist in the atmosphere in seasons when the public health is very good, yet it is remarkable that they *abound* coincidently with the prevalence of epidemic disease; we have it recorded that rust and mildew have sprung up so rapidly upon articles of food and garments as to have appeared to herald approaching plagues, and to have been mistaken for "blood rain," striking consternation and terror into the inhabitants of many a city. So-called "blood-rain" is said to have been the forerunner of the plague of Rome. The present year has been especially characterised by the prevalence of all kinds of rust, moulds, and mildews, upon vegetation in general, more or less all over the world, to a marked extent at the Cape and in Ireland. We therefore must expect to find the air at the present time thoroughly well-charged with the germs of minute vegetable life. Suppose it be shown that the blue mist is due to a special abundance of fungi elements, it does not follow that the phenomenon has to do with cholera. The co-existence of the "mist" and cholera may only be a coincidence. The same depressing influences that render the human family subject to epidemic diseases also affect vegetable life in general, and predispose it to the attack of parasites—a view which is held by many trustworthy observers. It would be strange indeed if there were not some relation between diseases of plants and animals. Aërozoids, we suspect, are, in the majority of instances, germs of the uredo and penicillium.—*Medical Times and Gazette, Sept.* 1, 1866, *p.* 228.

88.—THE DETECTION OF POISONOUS ALKALOIDS IN ORGANIC LIQUIDS.

The medical practitioner is sometimes called upon to examine organic liquids, such as beer, tea, vomited matter, &c., for poisonous organic substances; and since the extraction of them has always been an affair of some difficulty, a method recently described by Wagner in the *Zeitschrift für Analytische Chemie* may be of interest. Supposing the liquid to contain ·002 to ·004 grammes of alkaloid in about a litre measure, the following method is adopted:—The liquid is first diluted with twice its weight of water, and then two cubic centimetres of a solution of iodine in iodide of potassium (127 grammes of iodine to the litre) are added to it. This produces a deposit, which, when separated from the liquid, is dissolved in a dilute solution of dithionite of soda. The second solution is again treated with the iodine solution, and the resulting precipitate is this time dissolved in an excess of sulphurous acid. The solution thus produced, when freed from the sulphurous and hydriodic acids it contains, consists of the alkaloids sought for, in the state of sulphates, and quite free from organic matter. These may now be recognised by the usual tests.—*Lancet, Sept.* 8, 1866, *p.* 267.

89.—CASE OF PARACENTESIS PERICARDII.

Under the care of Dr. CLIFFORD ALLBUTT, at the Leeds General Infirmary.

[This rare operation was lately performed at the Leeds Infirmary in a case of acute rheumatic pericarditis, and with perfect success. The patient was 26 years of age, and was admitted on September 18th, 1866.]

On admission he was suffering from very acute rheumatism, both muscular and arthritic, and there was considerable dyspnœa and oppression. On examination the pericardium was found to be much distended with fluid, and there was acute pain in the region of the heart. A blister over the heart was ordered, and full alkaline and opiate treatment.

On September 19th, about 11.30 p. m., Dr. Allbutt was hastily summoned to see the patient, who was found sitting up in bed, with his elbows on his knees, struggling for breath. He was covered with a cold copious sweat. The area of pericardial dulness was found to be considerably increased, occupying nearly the whole of the left chest in front. There was perfect resonance all over the left lung behind. The patient was clearly at the point of death, and Dr. Allbutt determined at once to ask Mr. Wheelhouse to tap the pericardium. Mr. Wheelhouse was, therefore, called in to see the patient.

The extent of the pericardial dulness was now accurately defined, and the probable position of the apex of the left ventricle and of the auricle was as far as possible ascertained. Mr. Wheelhouse determined to open the sac half an inch from the sternum on the left side, and opposite the upper margin of the costal cartilage of the fifth rib. He passed in a fine trocar, inclining it slightly upwards and inwards, so as to enter, if possible, opposite the centre of the left ventricle. He pushed it onwards until he could distinctly feel the movements of the heart with the instrument; and then, sheathing the point, he pushed the canula well up to the heart until he could both feel and see the impulse. The trocar was then wholly withdrawn, and the fluid allowed to escape. This it did in a steady stream at first, which soon subsided into a saltatory flow coincident with the heart's contractions. The fluid consisted of a pale-pink coagulable serum. On the whole, about two and a-half or three ounces escaped. During the operation the patient gradually obtained relief, and, after the canula was withdrawn, the bed-rest was removed, and he was able to lie down. The breathing was now only 36 per minute, and he was able to speak a few words and express that he felt relieved. The pulse had lost its rapid and struggling character, and could easily be counted, its number being about 110. The area of dulness was very decidedly lessened, but it was not thought well to tease the patient again

with a minute examination. Mr. Coleman was good enough to sit up all night with the patient, who passed it in tolerable comfort, though there were several threatenings of syncope, which were warded off by large and repeated doses of brandy: all other medicines were omitted.

Next day the cardiac dulness had not increased. On the evening of this day (September 22), the breathing again became more laboured, and considerable delirium came on. Another large blister was placed over the region of the heart, and half-a-drachm of liquor morphiæ was given; ten drops were ordered to be repeated every six hours. A comfortable night was thus passed.

On the whole the patient may be said to have steadily improved from this time, and on October 13th he was discharged cured. The pericardial dulness on his discharge was little, if any, beyond the normal extent. There was a loud blowing systolic murmur heard over the apex.—*Medical Times and Gazette, Nov.* 3, 1866, *p.* 474.

90.—ON THE TREATMENT OF ANEURISM BY ACUPRESSURE.

By Henry Lee, Esq., Surgeon to St. George's Hospital.

[It is generally thought that the primary object in the treatment of aneurism should be to retard the circulation of the blood through the tumour. The truth of this is, however, doubtful; for when circulation is entirely arrested by two ligatures placed a little way apart, hardly any coagulation takes place in the blood included between the two ligatures. Speaking of wounds of arteries, Mr. Lee continues:]

Neither slowness of motion of the blood, nor any large quantity of coagulum, is necessary for the due performance of the process of union. It takes place commonly and readily in veins even after a wound has been opened several times, without any obstruction to the circulation; and all that is requisite in order that it may in like manner take place in arteries is that the circumstances may be similar. Thus it is not retardation of the circulation, nor the quantity of fibrin deposited, that is essential for the cure of an aneurism; but some mode of preventing the impulse of blood upon the newly-formed adhesions: in other words, apposition and rest. These objects may be attained in various ways. Whether intentionally or not, all the operations for aneurism which have been introduced, since the severer operation of amputation, as recommended by Pott, and that of opening the sac, as advised by the older surgeons, have been abandoned, tend to favour these conditions. What has been termed the Hunterian operation does so in a marked degree: the coagulum is left undisturbed, and the impulse is taken off the injured vessel. Instrumental compression, which has lately been used with a considerable amount of success, has evidently the same effect. This practice, as old as the time of Hunter, failed at first from the fact that those who attempted it tried to stop the current of the circulation, and thus produced a degree of pain which it was impossible for the patient to bear. With digital pressure the effect is essentially the same, but the degree of compression must necessarily be constantly varying.

The treatment by flexion is a discovery due to Mr. Ernest Hart. The sac, and consequently its contents, are prevented from being distended by being pressed upon in all directions by surrounding structures. The impulse of the blood, by the compression of the tumour against the upper part of the artery, is at the same time diminished.

Thus in all these methods of treatment the same essential conditions are provided for—viz., rest and apposition more or less direct of the diseased or divided coats of the artery. It is true that cures have been effected in other ways. Thus the coagulum has been rendered so firm by galvanic action, or by the injection of the perchloride of iron, that it has not yielded before the pulse of the heart; and this is to do by artificial means that which is naturally done in animals. And instances where this mode of treatment has been suc-

cessful does not in the least militate against the necessity of the two conditions upon which I have insisted.

Now, in the various plans of treatment which I have mentioned, we may observe a gradual progress towards the accomplishment of the same end by more simple means. The old operation involving the opening of the sac was succeeded by modifications of the Hunterian operation. This, in many cases, was superseded by various modes of compression; and this again by the less painful and less tedious plan of acute flexion.

I have now the pleasure of submitting to the consideration of the profession what, I believe, may prove a still more simple and more certain plan of treatment, at least in some cases—viz., the treatment by acupressure. I cannot but remember that six years ago I had the pleasure of reading before the Medical Society of London a paper, which was subsequently published as a separate essay. In this I advocated acupressure in certain operations upon the veins—a mode of proceeding which I had at that time practised for a period of seven years. In performing the operation for varicocele it had occurred to me occasionally to wound one of the branches of the spermatic artery, which was not controlled by the needles already introduced. Arterial hemorrhage would then take place; but this was always commanded by introducing another needle, so as to compress the bleeding vessel. During this period a case occurred which left a strong impression on my mind that the action of arteries in other situations might be more simply and more effectually controlled by acupressure than by other means.

A young man had a wound in the palm of his hand, from which there was a copious hemorrhage. Various attempts were made to secure the divided ends of the vessel. These all failed. The radial artery was tied, and the ulna artery was tied, and I believe ultimately that the brachial artery was tied; but however this may have been, the arm was at length amputated. It occurred to me that the hemorrhage might have been restrained by means of needles pased through or underneath the bleeding vessels; and this I mentioned to a friend at the time before the amputation was performed. That such a mode of treatment might be effectual in similar cases has since been fully shown by Sir James Simpson's admirable work on "Acupressure as a Means of arresting Surgical Hemorrhage."

I will now give a case in which I had an opportunity of putting this plan of treatment into practice in a case of traumatic aneurism.

Henry G——, aged nineteen, admitted into St. George's Hospital on the 16th of September, 1866. On the 9th of September he received a wound on the lower part of the left popliteal space from a sharp knife. The wound at the inner side of the leg passed obliquely outwards to the extent of an inch or more. There was a great deal of hemorrhage at the time, but this was stopped by a handkerchief being tied round the limb. The handkerchief was allowed to remain until the 12th, when it was removed, but again applied. There was not any hemorrhage at this time. Having removed the handkerchief on the 15th, the bleeding recurred. He was now admitted into the hospital. There was a tumour on the lower and rather to the inner side of the popliteal space about the size of a large chestnut. This could be felt and seen to distend with each arterial impulse. When the tumour was forcibly compressed by the thumb, the posterior tibial artery still pulsated. A consultation of the surgeons of the hospital was held upon the case, after which a long slender needle, previously made for the purpose of acupressure, was introduced immediately to the outside and above the tumour, which was at the same time pressed inward by the point of the finger. The needle was made to penetrate deeply into the popliteal space; its point was then turned inward, and brought out immediately behind the internal tuberosity of the tibia. From the grating sensation convey edto the fingers at this time, the needle must have passed through some fibrous or tendinous structures. A small quantity of blood escaped at each aperture which the needle had made; this was not of a dark colour, and there was no evidence of any large vessel having been pierced. The pulsation in the tumour stopped immediately that the needle was introduced, but the pulsation in the posterior tibial

artery in the lower part of the leg could still be distinctly felt. It appeared from this, and from the experiment previouslym ade of compressing the artery. that the aneurism had arisen from a branch of the popliteal artery, and not from the popliteal itself, and that the acupressure needle must have passed between the main artery and the wounded branch. Although the tumour had ceased to beat, a piece of cork was placed immediately above it and a little to its outer side, and confined in its position by an elastic band passed over the extremities of the needle.

July 20th. There had been a little pain up the thigh, but none near the aneurism; no pulsation in the tumour.

22d. The indiarubber band was removed, but the needle was allowed to remain. There was some very slight irritation at the points where the needle passed through the skin. There was no other pain or inconvenience. The skin of the leg for a considerable distance was still discoloured, presenting the appearance of having been bruised.

24th. The acupressure needle was removed (on the sixth day). Some serous fluid followed its extraction, and a very small quantity of blood. A pad of lint was now placed over the situation that the needle had occupied, and retained in its position by a bandage.

26th. The pad and bandage were removed: Some dark, grumous-looking fluid escaped from the original wound. No pulsation in the tumour, nor fresh hemorrhage.

27th. The bandage was again removed, and a smaller quantity of the same kind of fluid escaped from the wound as on the preceding day.

29th. The wound discharged only a very small quantity of serous fluid.

Oct. 2nd. There was now no discharge from the wound. Some thickening could be felt in the situation of the aneurism, but there was not the slightest pulsation. The pulsation in the posterior tibial artery continued natural. The skin of the leg still remained discoloured.

4th. Feels quite well, and is in no pain. The wound has nearly healed.

6th. Was allowed to get up.

13th. Has had no unfavourable symptom since the last report. The discoloration of the limb had disappeared. He left the hospital apparently quite well.

The patient presented himself at the hospital on the 20th, and again on the 27th, when, with the exception of the scars of the original wound and of the acupressure needle, the limb was perfectly in its natural condition.

This case occurred in a young man; it was a traumatic aneurism, and it was in a branch only of the main artery. It does not therefore follow that an ordinary aneurism of the popliteal artery would be cured by the same plan of treatment. On the other hand, it must be considered that this must have been a large branch, that it was very near its parent trunk, that it doubtless had its accompanying veins and nerves, and that these sustained no injury from the degree of pressure which was applied to them. Considering that an aneurism of this size and in this situation was so speedily and so completely cured by acupressure—considering that the degree of pressure required is not such as to stop the circulation, and taking into account the fact that an acupressure needle may at any moment be removed, the facts are, I think, sufficient to justify the trial of this mode of treatment in other cases of aneurism. Should increased experience confirm the *à priori* reasoning, there is, I think, little doubt but that this would be a simpler and more effectual way of preventing the arterial impulse than any other hitherto practised.

In conclusion, I may mention that the needles best adapted for compressing large arteries are curved, with rounded, not cutting points. These, when used, should be held firmly in a handle which can easily be removed. With a needle of this kind it is not easy to wound a large vessel in the living body.

[At a meeting of the Medical Society of London, at which this paper was read, the following observations were made on the subject.]

Mr. LAWSON TATE had always employed acupressure, and thought the only danger connected with it was that of putting it at random under large vessels. You must dissect carefully down as for the application of ligature. The

pressure is sometimes kept up too long, when suppuration may result, in the case of a femoral artery, pressure for twenty-four hours is sufficient. Acupressure can be adopted in positions where ligature cannot be safely used. The essential condition for success is that the inner coat of the artery should *not* be lacerated, for if the two sides of the artery are kept together for a few hours they will unite. For six or seven years he had never used a ligature, and never been troubled with secondary hemorrhage. The great danger lies in compressing veins, not nerves. In two dogs he allowed needles to remain twelve and eighteen hours in the femoral vein; both died of embolism.

Dr. MACKINLAY, of Paisley, in an aneurism of the brachial artery, had passed one needle above and the other below the aneurism. In two parallel cases, the one treated by acupressure and the other by ligature, the former did the better. Never once, out of sixty to seventy cases, had he found secondary hemorrhage to occur. He mentioned a remarkable case in which, after acupressure had been badly applied, he was obliged to tie successively the femoral, the external iliac, and the common iliac, and the patient ultimately did well.

Mr. LEE replied, and remarked that it was more difficult than most persons supposed to wound a vein or artery with a moderately blunt instrument. If you dissect down to a vessel you are much more likely to have suppuration around it than by simply passing a needle under it. In the case brought before the society, the operation had not been done at random, but after a careful diagnosis. He denied, as being contrary to all experience in London, that the lining membranes of arteries and veins, when the two sides are brought into apposition, unite readily by adhesion, as stated by a former speaker.—*Lancet, Nov.* 10, 1866, *p.* 520.

91.—A CASE OF POISONING BY CHARCOAL VAPOUR.

Under the care of Dr. RADCLIFFE, at the Westminster Hospital.

We are indebted to Dr. Maclure, registrar to the hospital, for the following very interesting case:—

G. P., aged 37, a stout, muscular man, was brought to the hospital at three p. m. on the 19th of May last, completely comatose, and incapable of being roused by any means. His breathing was laborious and stertorous—36 respirations per minute. The cheeks were flaccid and puffed out at each expiration. Every eighth or tenth inspiration was deeper than usual, and of a sighing character. A considerable quantity of frothy mucus collected about the lips. The countenance was pale, but not livid; the skin warm and moist; the pupils were fixed and dilated; pulse about 90, moderately strong. He remained quite insensible to such stimuli as galvanism or pinching; but about four hours after his admission he showed some signs of pain when his whiskers were pulled. He was placed near an open window, with free access of fresh air. A purgative enema was administered, and mustard poultices applied to his legs. As he was unable to swallow, nutrient enemata were administered during the night. Towards the following morning consciousness gradually returned; he began to speak, and wished to go home. On questioning him, it appeared that, being at the time in perfect health, he had, at midnight on the 18th, shut himself up in a small room, closing the window and keyhole of the door. He then lighted a pan of charcoal, which he placed at a little distance from the bed, but rather at a lower level, and lay down. At one o'clock he got up, stirred the embers, and returned to bed, having felt nothing particular in the interval. Soon afterwards he fell asleep, but without experiencing any uneasy sensations, and he remembered nothing until he awoke in the hospital, more than twenty-four hours afterwards. He was discovered late in the morning of the 18th, and had been actively treated before he was brought to the hospital.

On the 21st he was quite sensible, and complained of some pain at the

epigastrium. His tongue was dry, and covered with a white fur; breathing easy. His urine was retained and required the use of the catheter. On closer examination, Dr. Radcliffe observed that there was some anæsthesia and loss of power in the lower limbs, and that reflex movements could scarcely be excited by tickling the soles of the feet. In the evening he complained of pain in the chest; there was some dyspnœa and cough, and frothy mucous expectoration. A blister was ordered to the chest in order to relieve these symptoms. His diet consisted of beef-tea and milk, with bread.

24th. The cough and dyspnœa are much better; the tongue is moist and cleaner; pulse 96; paralysis and anæsthesia much abated. He now complains of acute pain in the glans penis, which prevents his sleeping; and his urine sometimes dribbles away involuntarily, notwithstanding the daily use of the catheter. The urine is alkaline, and loaded with pus; specific gravity 1023. Under the microscope it exhibits pus-corpuscles with crystals of triple phosphate. He seems weak, and his pulse is 100, and not strong. Ordered six ounces of gin and half a drachm of tincture of hyoscyamus in one ounce of infusion of buchu every four hours.

The next day he was rather better, and continued so until the 30th, when he complained very much of pain in the glans penis, with frequent desire to micturate, passing only about half an ounce of urine at a time. The catheter was passed, and about twelve ounces of turbid purulent urine drawn off. Tongue furred and white; bowels confined. To have a warm hip-bath and a dose of house medicine; a suppository containing four grains of opium was administered after the bowels had acted.

On the 31st all the symptoms were much relieved; and from this time he gradually recovered. He remained in the hospital for several weeks, complaining chiefly of debility, but was ultimately discharged, completely recovered from the effects of the poison.

The paralytic symptoms and the strong tendency to catarrh of the mucous membranes, first of the lungs, and afterwards of the bladder, after the primary apoplectic condition had passed away, were remarkable points in the history of this case. Such consequences as these, Dr. Maclure says, are not described in the works of Christison or Taylor, or of the various French writers on poisons in similar cases. The man stated that he was in perfect health at the time when he made the suicidal attempt; and there seems to be no other way of accounting for these inflammatory symptoms than the accumulation of the mixed gases in the blood. The patient does not either appear to have experienced the usual immediate effects of the inhalation of carbonic anhydride, or carbonic oxide, such as headache, giddiness, noise in the ears, &c., before becoming insensible. As the products of the combustion of charcoal may differ very much in consequence of variations in the supply of oxygen, it would seem that in this case the gases were either too much diluted with air to produce the ordinary effects, or that some of them (possibly carbonic oxide) may not have been formed.—*Lancet, July* 21, 1866, *p.* 66.

92.—ON THE ACTION OF MEDICINES AS INFLUENCING OXIDATION AND NUTRITION.

By Dr. H. Bence Jones, F. R. S., &c.

The first great division of medicines consists of those which directly or indirectly promote or retard oxidation.

Medicines that directly promote Oxidation.

1st. Iron is probably one of the most certain remedies we possess, and when used in right quantity and at the right time, it seems as though its progress could be watched and its benefit accurately determined by the improved colour of the blood.

When a soluble salt of iron is taken, in a few hours some part of it is

converted into a sulphuret, or is reduced to the state of oxide in the bowels, and thus losing its solubility and power of diffusion, it is thrown out as perfectly useless as if it had never been taken.

Another part escaping precipitation remains dissolved, and passes in from seven to ten minutes, when the stomach is empty, into the urine, where it may be detected, partly oxidised, if capable of oxidation. by the ordinary chemical tests; and this part also is of no use unless some local action of iron on the urinary passages or bladder is required.

A third part, instead of passing off in the urine, diffuses from the liquor sanguinis into every texture, and into the blood-globules and white corpuscles, making a greater formation of hæmatocrystallin, and thereby promoting that combination with protagon on which the production of new blood-globules depends.

These blood-globules exercise a chemical action on the oxygen of the air with which the membrane of the air vesicles transmits, and they and the fibrin together appropriate the incoming oxygen and carry it to the capillaries, whence it must diffuse into each structure to support the oxidation which takes place everywhere.

Hence, speaking generally, the more iron we absorb the more blood-globules we form, the richer also the muscles become in hæmatocrystallin, and the more oxygen is taken to the capillaries, and the more oxidation proceeds in the tissues and in the blood.

2ndly. Oxygen itself, and still more ozone, may be considered as direct promoters of oxidation. From the time of Dr. Beddoes and Mr. Boulton to our own time, by inhalation or imbibition, these remedies have been used, but hitherto there has been no general recognition of their worth at all comparable to that which exists regarding the value of iron. Theoretically, ozone, if not oxygen, ought to be a most potent remedy in the treatment of diseases arising from suboxidation, but as yet the right mode of using these agents, except as fresh air, has not been discovered, and probably until some means is found of keeping up the continuous action of these gases no considerable benefit will follow their use as medicines.

3rdly. Alkalies furnish out of the body and in the body the most marked evidence of assisting in oxidising actions.

Very many substances are included in the class of alkalies, and probably no two of them have the same degree of action, although all have a general resemblance. Different alkaline substances diffuse into the blood and into the textures at different rates, partly on account of difference in the power of diffusion, but partly also on account of the amount of similar substances already present in the tissues. Thus, for example, carbonate of soda, carbonate of potass, carbonate of lithia, and phosphate of soda will pass in and out of the textures at different rates, according to the amounts of these substances already present in the fluid that saturates these tissues. The greater the difference between the quantity of substance in solution on each side (inside and outside) of any membrane, the quicker will equilibrium by diffusion be produced, and the sooner will the greatest possible action of the substance be obtained; and when the equilibrium is produced no further passage of the substance into the membrane will take place.

In the Medical Times and Gazette for September, 1865, I have given some account of the action of alkalies or organic substances and of the rate of passage of some alkalies into and out of the textures; and from the experiments there related you will see that there is every reason to believe that alkalies do act most powerfully by directly promoting oxidation. Wherever they diffuse they chemically assist the action of the oxygen there, and ultimately lead to the formation of carbonic acid. Hence the most efficacious alkalies are those that pass in most readily, and can be taken in the least neutralised condition. Thus caustic alkalies are more potent than subcarbonates, and carbonates more potent than bicarbonates.

4thly. Chlorine, iodine, and bromine are substances closely related in chemical properties, and all promote oxidation in the body by taking hydrogen from water and thereby liberating oxygen. Thus these substances act even

more strongly as oxidisers than oxygen itself acts. For example, solution of blue indigo may be exposed freely to the oxygen of the air without being oxidised; but on adding chlorine, iodine, or bromine to the solution, oxidation immediately occurs.

When combined with alkalies these substances have sometimes a very different effect from that which they possess when free, for iodine is to iodide of potassium as chlorine is to common salt. But, like common salt, iodide of potassium is decomposed by some organic acids; thus we see it is decomposed on the skin when used as a lotion or as ointment, and thus hydriodic acid may be liberated in the textures, and this acid sets free iodine when air or free oxygen is in contact with it. Hence, when the oxidising action is certainly required, chlorine, iodine, and bromine should be used in the free state, and the combinations of these substances with alkalies will not always produce the same amount of action as the free substances themselves are able to effect. That the neutral compounds possess strong actions is well known in medicine, and the power even of common salt to form chemical compounds with the innumerable neutral substances that occur in the body, as for example the compounds of salt and urea and salt and sugar, shows that the iodides and bromides, wherever they penetrate, act chemically (though not as oxidisers always) on a multitude of organic and inorganic substances with which they come into contact.

5thly. Nitrates, chlorates, permanganates, and iodates are occasionally given on the supposition that they liberate oxygen in the body, but there is as yet no proof that any of these substances can give rise to an increase of oxidation in the textures. Alkaline permanganates and nitrate of silver are so rapidly decomposed on touching any organic substance, that they must be deoxidised long before they can pass out of the blood into the textures. The permanganate of potass can scarcely have passed the lips before it has given up part of its oxygen to the mucus of the mouth. Hence, probably, the efficacy of all these substances is quite independent of their chemical power as oxidisers.

6thly. Many other substances when taken in any quantity have a strong chemical action—for example, salts of zinc, salts of copper, salts of antimony, and salts of mercury; of all these, the salts of mercury are the most remarkable on account of the use that has been made of them in the treatment of almost every disease in England. Salts of mercury belong to the class of irritant poisons; substances that act chemically on the organic matters with which they come in contact, causing increased chemical action. The more soluble the preparation, the more violent the action on the different organic and inorganic substances with which it comes in contact. The solubility of corrosive sublimate in a solution of albumen, and the solubility to a slight degree of calomel in common salt, probably is the cause why these substances are capable, the one quickly, the other slowly, of passing into every texture of the body, and when there, the same increased chemical action takes place as we see occurs in the gums as the earliest sign of the constitutional affection by mercury. This increased chemical action cannot occur without increased chemical oxidation taking place in the same part at the same time. So that mercury salts, instead of stopping inflammation, actually cause increased oxidation, and the efficacy of mercurials in inflammation depends on a power of exciting the secretions and of irritating the mucous membrane from the stomach downwards, by which the bile is made to pass into the duodenum and mucus into the intestine, and on a chemical action on fibrin and albumen which stops the coagulability of the liquor sanguinis, and renders effused fibrin less cohesive, and so more easily removed by absorption, than it otherwise would be. Its reputation as an antiphlogistic probably is greatly due to its combination with opium, of which it corrects the chief inconveniences—namely, stoppage of the action of the liver, bowels, and other organs.

7thly. Many organic substances—as, for example, croton oil, castor oil, elaterium, ipecacuan., jalap, aloes, and many others—contain some oily or extractive matter, which acts on the outer or inner skin, and when absorbed gives rise to increased chemical action, whence come heat and oxidation, and

more rapid circulation and quicker nutritive changes. If the increased chemical action rises to a sufficient height, then the increased circulation causes mechanical obstruction and congestion, and inflammation is the final result.

8thly. Counter-irritation must be considered as an oxidising action. The simplest example is friction, which not only acts by promoting mechanically the circulation of the blood, but the increased heat from the mechanical action gives rise to increased molecular change; in other words, to increased chemical action. External heat in all its different methods of application or production—as, for example, poultices, fomentations, water-dressings, flannels, cottons—acts in the same way as an equivalent amount of mechanical action would do. Increased thermal action cannot exist without increased molecular action.

Electricity differs from mechanical, thermal, or photal motion in its capability of passing into each texture according to its conductivity or resistance. Hence this form of motion may penetrate far deeper into different structures and affect actions in parts of the body far beyond the reach of mechanical or of thermal force.

Medicines that indirectly promote Oxidation.

The causes that determine the force and frequency of the heart's contractions are so many and so complicated that it is with the greatest difficulty that the effect of medicines on the circulation can be determined by experiment.

Among these causes are, first, the action of the nerves; secondly, the action of the muscular structure itself; and, thirdly, the chemical and mechanical quality and quantity of the blood, and its relative proportion to the system of vessels in which it is contained.

The present state of our knowledge regarding the influence of the different nervous systems upon the circulation shows that at the centre and probably also at the periphery a highly complex nervous action, partly stimulating and partly checking the contractions of the heart and vessels, takes place.

That a stimulating and a checking action of the nerves on the heart exists, and is in the highest degree complex, is evident from the following facts :—

1stly. The heart, at least in cold-blooded animals, when removed from the body, goes on beating. Hence there must exist in the heart itself a centre of rhythmical action, the seat of which must be placed in the ganglionic cells which are disseminated through the heart's substance.

2ndly. On cutting the cervical portion of the ninth pair of a warm-blooded animal, the frequency of the heart's pulsations is remarkably increased, and on tetanising the extremity of the nerve, which is still by its cardiac branches in connexion with the heart, its motion is slackened, and may even easily be stopped altogether. Hence the ninth pair must be regarded as the heart's inhibitory nerves.

The inhibitory action can also be exercised through the same nerves by stimulating the parts of the brain between the calamus scriptorius and the corpora quadrigemina from which these nerves arise, and this leads to the conclusion that there exists in this part of the brain a centre which incessantly controls by means of the ninth pair the rhythmical action of the centre in the heart itself.

But the perfection of the machine and the complexity of the nervous action do not end here.

3rdly. The action of the heart may also be stimulated by tetanising the cervical portion of the sympathetic nerve, and hence there is reason to believe that there is somewhere in the upper part of the spinal marrow a stimulating centre connected by the sympathetic fibres with the ganglionic cells of the heart.

4thly. On the other hand, experiments on the heart of cold-blooded animals, removed from the body, can only be explained by the assumption of an inhibitory centre, situated in the septum atriorum (or common substance of the two auricles in frogs). Thus, then, there exist at least four different centres of nervous action:—A stimulating (or musculo-motory, as it is called) centre in the heart, and an inhibitory centre there also, and these counteract

eadh other. Then there is a similar pair of centres in the brain and spinal marrow, connected, apparently, with the corresponding centres in the heart by two sets of nerves, the ninth pair and the sympathetic.

A poisonous agent may be carried to and act on any of these four centres, and thereby stimulate or check the heart's motion. Thus, for example, digitaline does not act upon the heart itself or on the nerves in the heart, but upon the inhibitory centre in the brain; its effect is produced through the ninth pair, for when these are cut digitaline does not act.

Still further complicating the nervous action, the inhibitory centre in the brain is in connexion with the sympathetic nerve, so that the action of the heart can be stopped by reflex action of the sympathetic nerves. Thus Bernstein has shown that when the two trunks of the sympathetic nerve in the abdomen are isolated (as can easily be done in the frog) and tetanised, the heart is seen to stand still as long as the ninth pair are entire.

As the sympathetic nerve and the ninth pair regulate the action of the heart, so the same power of contracting and relaxing the muscular fibres of the blood-vessels in the sublingual salivary glands, according to the experiments of Claude Bernard, is exercised by the sympathetic nerve and the chorda tympani.

If the filaments of the sympathetic nerve alone as they enter the gland are tetanised, a highly concentrated saliva is secreted, and the blood flows out of the gland of a dark colour. If, on the contrary, the chorda tympani alone be tetanised, saliva is secreted copiously, containing no great proportion of solid matter, whilst the blood that flows out of the gland is brightly coloured, like arterial blood, and sometimes the arterial impulse can be distinctly traced beyond the gland into the veins.

These results, so far as the colour of the blood and the abnormal pulse in the veins, can only be explained by assuming that the small blood-vessels in the gland are caused to contract by tetanising the sympathetic nerve, and that they are caused to dilate by tetanising the chorda tympani.

It is possible that a similar arrangement prevails throughout the whole circulatory system, but hitherto the existence of nerves which cause the vessels in general to contract has alone been demonstrated.

The consideration of the causes that disturb the circulation becomes still more complicated when the power of the muscle itself and the action of the fluid that circulates in the vessels and the resistance at the periphery have to be taken into account.

The power of the muscle itself may be affected by medicines, by nutrition, or by resistance. For example, it is most probable that veratrine stops the action of the heart in a totally different manner from digitaline, by affecting the muscular structure of the heart itself without the intervention of the nerves.

Moreover, the quantity of the blood and the average or total pressure which exists in the whole or in a part only of the circulation have been proved materially to affect the heart's power and frequency of action. Whenever an abnormal resistance is set up in any part of the system, as is, for example, the case in so many of the affections of the different textures of the kidney comprised under the name of Bright's disease, the action of the heart is increased, just as the action of any voluntary muscle has been recently shown to be increased, by adding to the weight it has to lift; and whenever the proportion which the bulk of the blood should normally bear to the capacity of the vascular system is altered by the contraction of the small arteries, the increase of average pressure thus produced increases the frequency of the pulsation of the heart, as Ludwig and Thiry have demonstrated.

By chemical or mechanical action upon one, or more than one, of these different nervous or muscular centres of force, medicines may increase the frequency or the force of the contractions of the heart. In consequence, the blood will be sent more quickly through the capillaries, and greater rapidity of chemical circulation through the different textures will be produced, and from this increase of oxidation and nutrition will arise.

Dr. Traube's experiments on the effects of digitaline, nicotine, oxide of

carbon, curare, and antiarin all show the exceeding complexity of the action of these substances upon the heart; but from such experiments we shall obtain the data for rightly estimating the action of remedies on the nerves, and through them on the processes of oxidation and nutrition.

Medicines that directly retard Oxidation.

In this class are included that most important list of remedies which formerly constituted the medicinal part of the antiphlogistic treatment.

1st. Vegetable salines and dilute organic and mineral acids. These constitute the most directly acting remedies for fever and inflammation which we possess.

The oxidation of vegetable salines I have brought before you in the second lecture, Medical Times and Gazette, February 25, 1865.

The effect of organic and mineral acids in so checking oxidation as to cause even the accumulation of fat is mentioned in the seventh lecture, Medical Times and Gazette, December 2, 1865.

The first action of dilute mineral acids, when the stomach is quite empty, is on the mucous membrane and on the muscular structure; the nerves are not affected by dilute acids. When taken in the very small doses usually given, the alkalescence of the blood must quickly prevent any continued action of the acid as such on the blood-globules, the secretions, or the textures, but, by however little the alkalescence of the blood is diminished, or the blood-globules destroyed, by so much must the process of oxidation in the textures be diminished also; and if very large quantities of mineral acids could be evolved anywhere, accumulation and formation of fat, and probably a saccharine condition of that part, would be produced. The action of phosphorus, arsenic, and antimony in producing fatty degeneration of the liver, kidneys, and pepsine glands of the stomach, and in stopping the liver from forming glycogen, may partly depend on the production of the acids of these substances in these different places.

Some organic acids, as, for example, oxalic acid, act quite as strongly in neutralising alkalescence as the dilute mineral acids, and multitudes of these organic acids are formed in all the textures of the body, and that mineral acids and bile acids when in excess may even produce so-called fatty degeneration is rendered certain by the experiments of M. Kühne, Traube, Leyden, and Munk. Oxalic acid and the bile acids, in combination with alkalies, have also the power of stopping the muscular action of the heart, and bile acids also rapidly dissolve the blood-globules, and thus stop oxidation.

Even the syrup which enters into so many prescriptions must be considered in its action as equivalent to so much organic acid taken into the system, and temporarily at least neutralising so much alkalescence in the blood and in the fluid with which every texture is imbued.

Vegetable acid salts have always been considered as antiphlogistic remedies, and when oxidised to carbonates they may assist in the removal of organic impurities in the blood and textures by ultimately adding to the alkalescence of the liquor sanguinis, and thus promoting oxidation everywhere; but this action is entirely different from that of organic and mineral acids, which, by lessening the alkalescence of the blood, directly retard the process of oxidation.

2ndly. Preparations of lead. As acids are the antitheses of alkalies, so lead is the antithesis of iron. In the proceedings of the Royal Society, June 15, 1865, you will see some experiments on the rapidity with which, in guinea-pigs, salts of thallium pass into every texture, and can be shown to be present after six hours even in the crystalline lens. Whether lead passes at the same rate or to the same distance may be doubted, but at least it can be seen in the gums and be detected in the muscles of the forearm, and from this there is every reason to believe that it diffuses widely into each texture, and acts there according to the chemical properties of the different textures and substances with which the lead salts come in contact.

The multitude of organic substances from albumen to sugar that are precipitated by lead-salts shows the innumerable chemical actions that they

must occasion in the body. Probably they precipitate both the hæmoglobin of the blood-globules and muscles, and the protagon of the nerves and blood-globules. Certainly the most marked visible effects take place on muscles, nerves, and blood-globules. Combinations are formed which prevent further change, so that an arrest of action in the formation of muscles, nerves, and blood-globules, takes place. From the affections of the muscles and nerves, paralysis and pain are produced, and from the affection of the blood-globules anæmia results, and this causes diminished oxidation in the tissues, and hence accumulation of urates in the textures is apt to occur, and though acute or chronic gout may follow, yet the increased chemical action is usually insufficient to remove the deposit which the arrest of oxidation continues to produce.

3rdly. Oxide of carbon displaces the oxygen in the blood-globules, and forms a stable combination with the substance of the red corpuscles which is not destroyed by oxygen. Thus, carbonic oxide stops the passage of oxygen into the blood, and causes the same symptoms of poisoning as are produced by the hindrance of oxygen from passing into the blood.

Sulphuretted hydrogen, H_2S, is decomposed by the ozone of the blood, the sulphur being precipitated whilst the hydrogen reduces the blood to a lower state of oxygenation. An excess of sulphuretted hydrogen destroys the hæmoglobin of the blood and thus gives rise to a deficiency of oxygen in the circulation.

Arseniated and antimoniated hydrogen, H_3As, H_3Sb, have nearly the same action as sulphuretted hydrogen.

Phosphoretted hydrogen, H_3P, reduces the blood, becoming phosphorous acid, PH_3O_3, and producing asphyxia from want of oxygen.

Oxide of nitrogen, NO, acts in the same way as oxide of carbon, forming at first NO_2.

4thly. Sulphurous acid and hydriodic acid are direct deoxidising agents, and though the chemical actions they produce in the body may be able to produce heat and force in the body, yet the deoxidising action tends to stop the changes of oxidation which are going on in the body. The well-known action of sulphurous acid on nitrous acids, as in the manufacture of sulphuric acid, need not here be dwelt on. As the sulphurous acid takes oxygen from the peroxide of nitrogen or hydrogen, so hydriodic acid, when near a substance that easily parts with its oxygen, reduces it, and by this action these substances can retard the changes which may be taking place in the body; moreover, by neutralising alkali and by attacking the blood-globules, these and other mineral acids retard oxidation, and, like phosphoric acid, they are capable of producing fatty degeneration.

5thly. Gallic acid and tannic acid are strongly deoxidising agents. When in contact with alkalies, as in the blood, they are capable of taking oxygen even from the blood-globules. They probably have no action on the nerves or muscles, exciting no contraction of the muscular structure. The action of tannin in precipitating albumen and in forming indefinite compounds with the skin, gives no explanation of its action in astringing the small blood-vessels. The property of gallic acid as an astringent requires also fresh experiments for the explanation of its action.

6thly. Rest, general and local, for muscles and nerves, and cold, must be considered as means directly hindering oxidation.

The appearance of the arcus senilis first where the eyelid prevents the action of light, and the fatty accumulation in unused parts, are examples of the chemical effect of rest.

Medicines that indirectly retard Oxidation.

As in the causes that indirectly promote oxidation, so in those that retard oxidation, three different actions must be distinguished:—1st. An action on the nerves; 2ndly. An action on the muscles; and 3rdly. An action resulting from the quantitative and qualitative relationship of the blood to the vessels.

1st. On the checking or controlling action on the nerves that influence the action of the heart and the capillaries.

Of all the actions that can be produced by chemical agents acting in the body, this is the most remarkable for its rapidity and intensity.

The effect of so comparatively uncomplex a body as prussic acid (C_2NH) in bringing all action to rest is almost too rapid to be investigated experimentally; but the effect of more slowly acting substances—as, for example, morphia—shows quite as distinctly the mode of action of some of the most important agents that can be employed as medicines.

If any extremely delicate test for morphia existed, it would probably be found to follow the same course in rapidity and extent of action as quinine; when taken on an empty stomach, in less than fifteen minutes it would be detectable in the blood; and in every texture of the body it would reach its maximum in from two to three hours; whilst there it would act according to its chemical properties, and the properties of the different textures with which it was in contact. In twenty-four hours it would greatly decrease, and in seventy-two hours, by diffusion or oxidation, it would entirely disappear.

What the chemical action of alkaloids on nervous matter may be is not yet determined. In the intensely energetic action of ammonia on the functions of the nerves, destroying immediately the electrical and all other actions which the nerve can produce, there may be strong evidence of the kind of power which the large class of alkaloids possess in acting on protagon. Chemistry has hardly entered on this vast field of inquiry, although the researches of Kühne and Eckhard and others show that the effect of inorganic and organic acids, alkalies, neutral substances, and salts on nerve and muscle must be determined before any clear views of the action of remedies can be obtained.

As soon as the salts of morphia enter into every nervous filament, a molecular motion between the protagon and salt of morphia takes place; the resultant substance must be far less sensitive, far less capable of other molecular motion, than before, and until the morphia is destroyed by oxidation or removed by diffusion the nerve cannot recover its former mobility.

All experiments lead to the supposition that different alkaloids affect different parts of the complex nervous systems in greater or lesser degrees. Strychnia will act chiefly on the medulla; curarine and conicine will act most on the motor nerves; atropine will paralyse the nerves that contract the iris, while eserine will paralyse the nerves that dilate the pupil. No experiments at present can reach the causes of these variations, and for them and for other alkaloids we must take the fact and long for the explanation which chemistry will some day give.

The dry tongue, the stoppage of the secretion of gastric juice, bile, intestinal fluid, and of urine, the paralysis of the nerves that dilate the iris, the loss of mental and nervous power after morphia, all these actions are evidence of the effect of morphia in stopping all chemical action and in lessening oxidation by acting on the nerves which lessen the circulation of the blood.

In this way opium is one of the most potent antiphlogistic remedies we possess, and to it probably the calomel and opium treatment of this century owes its great reputation.

Of all the remedies that control hemorrhage, probably opium is one of the most potent. This is effected by the same mechanism acting through the same nerves that indirectly retard oxidation.

2ndly. Medicines that lessen the action of the muscles. Rest and cold are the most potent agents that can be mentioned here. Salts of potass, ammonia, and lead, and probably salts of zinc and baryta, and perhaps salts of antimony and veratrine, digitaline, and nicotine, may have a direct action on muscular substance, especially of the heart, rendering it less sensitive to nervous influence, and thus controlling its contractions and causing less active circulation, and thus indirectly retarding or stopping oxidation; but here also we must wait for further experiments before any clear ideas can be obtained.

3rdly. The qualitative and quantitative relation of the blood to the vessels can chiefly be affected in a negative sense by local or general bleeding, by dilutions, and by evacuations.

If now, then, we discard the last lingering trace of the theory of phlogiston, according to the present state of knowledge the antiphlogistic treatment is the retardation of chemical action; and as oxidation is the chief of all the chemical motions going on in the body, antiphlogistic treatment is the arrest of an excess of oxidation and of all the mechanical, chemical, and other actions which arise from it.

Medicines or Food that directly promote Nutrition.

It is not possible to draw any distinction between food and medicine; for oxygen, and iron, and water, and common salt are as necessary food as starch and gluten or fat and albumen, and increased supply of any substance that can enter into the structure of any tissue as surely promotes nutrition as increased supply of air increases oxidation.

The most remarkable example of increased nutrition by medicine is seen in the increased formation of blood-globules when iron is taken. The formation of hæmoglobin implies the formation of hæmatin, and without iron no hæmatin is produced, so that iron may be regarded as one food of the blood-globules. When it is absorbed in greater quantities than the ordinary food supplies, increased formation of hæmatin occurs, and in cases of anæmia this increased formation may be watched and stopped when it is considered that sufficient red colouring matter has been produced.

The chemical process by which the iron helps to build up the hæmatin is quite as unknown to us as was a few years since the formation of urea or any other of the innumerable organic substances which chemistry is now able synthetically to construct; but that the metal itself and many of its salts will lead to the increased formation of new blood-globules is proved by the innumerable preparations of iron that are in use in medicine, no one of which can be said to have an undoubted superiority in the cure of anæmia.

Possibly, by giving ready-formed hæmatin or hæmoglobin, a more rapid formation of blood-globules will be obtained than when any other preparation of iron is given.

The second remedy I may mention is phosphate or carbonate of lime in promoting nutrition of the bones. In cases of rickets, by giving ivory shavings, by powdered bone itself, by calcined bone, by pure phosphate or carbonate of lime, increased formation of bony substance may be produced.

The third medicine is cod-liver oil. This remedy clearly shows the impossibility of distinguishing between food and medicine. Its chief ingredients increase the deposit of fat in the cellular tissue, and this nutritive action on the adipose tissue differs in no respect from that which might be obtained by turtle, or cream, or olive oil. It is, however, quite certain that many substances besides oily matter exist in the cod-liver oil, and to these intermixed substances the cod-liver oil probably owes its medicinal repute. M. Chevreul has found no less than twenty-nine substances in mutton suet.

Fourthly, it is highly probable that other nutritive substances might be found which will specially promote the nutrition of particular textures, the more nearly in chemical composition the nutritive substance agrees with the texture to be nourished. Thus, in failing supply of the whole blood, the whole blood may be renewed by transfusion. In wasting muscle from exercise or other cause, meat may be the special remedy. Gelatine may perhaps supply the wasting cellular tissue, and even the highest of all textures, the brain and nerve substance, may perhaps be best restored by food of which these substances form a part. That phosphorus assists in the formation of protagon, as iron does in the formation of blood-globules, is far from any direct proof. Far less probability exists that phosphoric acid or the salts of phosphoric acid—as phosphate of iron and strychnia—can be so decomposed, and the elements recombined in the body, that the phosphorus may promote directly the nutrition of the brain or spinal cord. Whatever good these medicines may do otherwise, they can hardly be of use in helping the formation of protagon, either in the nervous substance or in the blood-globules. Phosphorus or phosphorous acid can be shown by direct experiments to be oxidised into phosphoric acid; and hence the phosphoric acid of our medi-

cines, though it may leave the iron or strychnia in great part to combine with soda and other alkalies, and may keep continually passing into a more or less basic salt, yet will never lose its oxygen by reduction, never be capable of combining with carbon and hydrogen to form that phosphorised oil which exists in the nervous substance. The worth or the worthlessness of phosphorus or phosphates as nutriment for the nerves must be established by experiments which the chemist alone is capable of making.

Medicines that indirectly promote Nutrition by, 1stly, increasing the action of the heart, and, 2ndly, by lessening the resistance in the capillaries.

The different ways in which the heart has its action increased I have already brought before you in speaking of medicines that indirectly promote oxidation. The exceedingly complex nervous system which makes the human machinery so far more perfect than any made by hand, renders it almost impossible to rightly estimate the way in which and by which different medicines, acting upon the different nervous centres, can cause increased action of the heart. It is not less difficult also to determine accurately the probable action of medicines upon the different nervous centres in lessening the resistance in the capillaries.

Besides these nervous actions, there is also the action on the muscle itself by medicines, and by the work which it has to do, and by the qualitative and quantitative variations in the fluid which circulates in the heart and vessels.

All these different actions lead to the same result, and that is, increased flow of blood to the part; and whatever cause produces a flux of blood to any structure, in that structure increased nutritive action will take place. The Hunterian experiment on the growth of the spur of the cock when implanted in the comb is daily repeated wherever, by mechanical and chemical or any other force, the quantity of blood brought to any part is increased. From corns to cancers, increased flow of blood causes increased growth of healthy and diseased structures; and in whatever way increased supply of blood to any part is occasioned, increased nutrition of that part or texture indirectly is produced.

Increased flow of blood to any part may be produced in at least four different ways by medicine.

First, there may be an action on the nerves which increase the action of the heart.

Secondly, there may be an action on the muscular structure of the heart itself.

Thirdly, there may be an action on the nerves that dilate the capillaries.

Fourthly, the quantity and quality of the blood in the heart and vessels may be improved, so that a smaller quantity may become equivalent to a larger quantity.

1st. Alcohol, ether and choloform, nitrous oxide, chloride of methyl, olefiant gas, before they are destroyed by the oxydising process going on in the body, have a very decided action on the heart through the nerves. This action on the nerves does not proceed from the action of the blood-globules, because the symptoms appear before any blood-globules are destroyed, because animals with white blood are affected by anæsthetics, and because animals, as frogs, the respiration of which is with difficulty interfered with, are easily and strongly affected by these substances.

The protagon of the nerves is readily acted on by these substances, and it is this same protagon in blood-globules that causes them also to be attacked and dissolved by these stimulants.

The first action of these substances, then, is a chemical combination with one ingredient of the nerves—this is the primary stimulating action; and as soon as this combination is formed the nerve is rendered less sensitive (perhaps by being made less capable of being acted on by oxygen than before), and until the foreign substance is removed by oxidation the nerve is checked in its action.

2ndly. Of all the medicines that stimulate the muscles, probably ammonia is one of the most remarkable. It has no exciting action on the nerves of

motion, but almost immediately deprives them of the power of exerting motion, but it acts as an intense exciter to the muscles.

3rdly. Of medicines that dilate the capillaries—that is, according to M. Bernard, by paralysing the sympathetic, which constantly tends to close the capillaries. This dilatation may be done in two ways—by dividing the sympathetic nerve, or by acting reflexly or directly on the cerebro-spinal nerve.

In the submaxillary gland, the vessels are relaxed and saliva flows when the superior cervical ganglion of the sympathetic is cut, when the lingual nerve is excited as by vinegar, or the chorda tympani is irritated. Curare paralyses all the motor nerves, and then secretion of saliva takes place.

4thly. Improvement in the quality of the blood is chiefly effected by iron and animal food; or the quantity in any part may be increased by friction or by other force.

Medicines that directly retard Nutrition, either, 1st, by themselves entering into combination with the organic substances of which the textures are composed, by which the chemical changes that would otherwise occur are stopped, or, 2ndly, by the accumulation in the textures of any of the substances resulting from the chemical changes in the textures.

Among the many mineral substances which act in the first way, lead is the chief, and probably zinc, silver, copper, arsenic, antimony, and even in some rare cases mercury, as, for example, in methyl-mercury, can also combine with nerves, muscles, skin, or other textures, rendering them incapable of going through changes on which their action depends.

Among the substances which act in the second way must be included all the different products from each texture in their downward course to carbonic acid, ammonia, water, and salts.

Even the accumulation of "ashes" may come to be impediments to the chemical changes on which nutrition depends, the old textures may cease to be removed, and "calcareous degeneration" may result.

When carbonic acid accumulates in the blood and textures from excessive carbonic acid in the air, it causes no convulsions, provided sufficient oxygen is at the same time supplied; but the carbonic acid passes from the blood to the nerves, and acts on the moving and on the regulating systems of nerves. At first the pressure of the blood is increased, and the frequency of the pulse becomes greater; then the regulating action prevails, the pulse becomes slower and larger; then the pressure sinks quickly and considerably. The regulating action is exhausted, and again the increase of pressure shows the excitement of the motor system remains. Soon the motor action in the medulla oblongata is lost, and that proceeding from the ganglia of the heart alone remains, and this gives only slight pressure, small and quick systole and diastole, and long intervening pauses. The action on the nerves of respiration brings the respiration as well as the heart to rest, less oxygen goes in, and more carbonic acid accumulates till the muscles stop.

With carbonic oxide the same phenomena are produced with the addition that an immediate action of carbonic oxide takes place on the hæmoglobin of the blood-globules, and probably also on the hæmoglobin of the muscles (Virch. *Archiv*, 1865). Carbonic oxide takes the place of the oxygen and hinders the escape of carbonic acid, so that not only a deficiency of oxygen but an accumulation of carbonic acid is produced by it, the blood-globules being made incapable of carrying on the escape of carbonic acid from the textures (Pokrowsky, *Archiv for Anatomie and Physiologie*, 1866, *p.* 59).

The organic acids are a next step nearer than carbonic acid to the textures; and if these accumulate in excess in the blood and textures, stoppage of oxidation and nutrition results.

Of all organic acids, the bile acids, even when combined with soda, have been proved by Kühne, Traube, and Hermann to have this action most decidedly, rapidly causing "fatty degeneration," dissolving the hæmoglobin, so that this constantly appears in the urine, and stopping the muscular action of the heart.

Other organic acid salts, as lactric, citric, tartaric, for the time they remain in the textures before they are thrown out or burnt, stop the changes going on in the textures, and thus retard nutrition.

Sugar or fat in quantity, when taken, not only may lead to excessive deposit of fat, but may stop the changes in the material that is being removed to allow of new matter taking its place, and thus these substances produce an arrest of nutrition, even whilst adding to the adipose deposit.

The nitrogenous substances that arise from the albuminous textures react also in stopping nutrition; in addition to a multitude of other chemical actions on different textures which these substances may posses. What the amount and nature of these substances may be, and what the difference of their actions, cannot at present be conjectured with any certainty.

Beginning with carbonate of ammonia, and then urea, there are substances like kreatinine, animal quinodine, and higher compounds of carbon, all of which, if they could be given as medicine, would check the formation of the downward products from albumen, and thus would retard nutrition. What other actions these substances possess in first combining with nerves and muscles, and then rendering them less active as long as the combination lasts, must be worked out by the most careful experiments; and among the multitude of substances that may ultimately prove to be formed in the body from albumen, perhaps we shall find the same poisons which, when procured from vegetables, we know produce the symptoms that constitute some of the diseases to which man is liable. Even animal strychnia and animal morphia may, like indigo, quinine, starch, or cellulose, be formed in the body by some modification of the process of repair.

Medicines that indirectly retard Nutrition by lessening the action of the heart and increasing the resistance in the capillaries, by which actions the flow of blood through the textures is lessened.

Four different actions may be distinguished, by any of which nutrition may be lessened—first, by action on the nerves of the heart; secondly, by an action on the muscular structure of the heart; thirdly, by contraction of the capillaries in consequence of an action upon the sympathetic nerve; fourthly, by the reduction, quantitatively or qualitatively, of the state of the blood.

It is impossible at the end of this sketch to bring before you in any detail the progress of experimental inquiry abroad on some of these subjects. I can now do little more than give you the names of some of the substances and the kinds of action which they possess, and I must refer you to the original works for full details of the experiments that have been made except in the single case of potash salts, which I shall take solely because it gives a good example of the progress that may be expected in therapeutical knowledge from scientific research.

A medicine may act in only one, or in many, or in all the different ways that I have mentioned, and practically there is rarely a limited action, for the medicine passes into every structure, and acts according to the properties of the substances with which it comes in contact.

1st. Of the medicines that act on the nerves of the heart in stopping its action, and thus making the circulation of the blood slower, strychnia is one of the most remarkable. When applied directly to the heart, it acts on the vagi nerves, lessens the frequency of the heart's action, and also on the ganglia. Nicotin acts on the vagi nerves alone. Conicine stops all the action in the peripheral nerves without affecting the muscular contractility. Digitaline first stimulates, and then paralyses the regulating nerves, and then stops the action of the muscle. Quinine first stimulates, and then lessens, the action of the motor nerves of the heart.

The difficulty of determining whether the retarded circulation depends upon an increase of the checking action of the nerves or upon a decrease of the motor action, whether in the heart itself or in the brain, is in many experiments exceedingly great, and, to add to the complication, a reflex action

on the vagi nerves may produce the same effect as though a poison had been applied to the vagi nerves in the heart itself.

Thus, as I have already said, mechanical irritation of the sympathetic nerve in any part of the abdomen may be reflected by the vagi nerves to the heart and stop its action. Of this the occasional effect of a sudden blow on the solar plexus, or of cold water when drunk, are familiar, though happily rare, examples.

2ndly. Of the medicines that act chiefly on the muscular structure of the heart, veratria may be taken as the most remarkable: it stops the contractility of the heart, and colchicine has probably the same action; both may also act on the nerves or muscular structure of the small arteries, and thus alter the circulation through the capillaries.

The effects of salts of potassium, compared with the effects of sodium salts, show that salts of potassium act very strongly on muscular contractility. When salts of potassium are injected into the blood, the pulse falls rapidly, and the pressure of the blood, when accurately measured, rises for the first few minutes and then falls, and if the injection is then repeated the heart stops beating.

A muscle, by the application of potassium salts, may be rendered unexcitable to the stimulus of electricity, and it may be restored by treatment with sodium salts. A nerve, also, when treated with potassium salt, loses much quicker its power of exciting contractions in a muscle than when a similar nerve is treated with sodium salt. Even a nerve of sensation, as in a tooth, may lose its power when treated with potassium salt.

So remarkable are the phenomena, that even a similarity has been stated to exist between the action of potassium salts and digitaline.

Microscopic observation shows that chloride of potassium may affect the blood-globules, making them contracted and granular, while chloride of sodium has no action of this kind.

3rdly. Of medicines that act on the capillaries, morphia is the most striking. It acts also first as a stimulant, and secondly strongly retarding on the nerves of the heart.

4thly. The blood is made less energetic in quality or quantity by bleeding, starvation, and excess of water; by lead salts and excess of acids mineral and organic.

Finally. If you look for a moment to the second great division of the healing art, you will find that, among other indications of treatment, two principal objects always present themselves to the surgeon. These are MECHANICALLY to control the working and repair of the body. In other words, he endeavours, qualitatively or quantitatively, to regulate by mechanical means the oxidation and nutrition which take place in every structure of the body.

Of each of these actions I must limit myself to one striking illustration.

The surgeon promotes oxidation in croup by mechanically opening the trachea. He retards oxidation after mechanical or chemical injuries by bleeding, by cold, and by rest, by defence from irritating substances. He directly promotes nutrition by removing pressure, as in the operation for strangulated hernia, and he retards nutrition by pressure or ligature in cases of aneurism.

As in Medicine, so in Surgery; the actions of oxidation and nutrition are mutually dependent everywhere, and no separation of these two functions in any part of the body really exists; and although I have endeavoured in this sketch to bring each of them separately before you, I have done so only in order that I might at least give you a clear though most imperfect view of the two most important of the many chemical actions of medicines which are now being worked out by experimental research. The progress of all accurate knowledge of the actions of medicines depends now on exact chemical and physical experiments, and by the perfection of these alone will the practice of our profession lose its doubts and difficulties and disagreements and deceptions, and become esteemed by all as the art that can confer the highest benefit upon mankind.

Instead of being as formerly blind wielders of heavy clubs that may cure

the disease or kill the patient; or instead of being as at present "judicious" or injudicious "bottle-holders," Physicians at some future time will estimate exactly the effect of the increased or diminished action of any one force upon all the other forces concerned in the production of general or local disease; and by adding to the resistance of one or more forces, or by liberating more energy by means of the powers that are latent in food and medicine, they will restore that equilibrium of action in the body upon which our health depends.—*Medical Times and Gazette, Sept.* 8 *and* 29, 1866, *pp.* 245 *and* 333.

93.—ON PROGNOSIS IN HEART-DISEASE.

By Dr. W. H. Broadbent, Assistant-Physician to St. Mary's and the Fever Hospitals.

In affections of the mitral valve, the effects of the derangement no longer fall upon the left ventricle, but on the auricle, lungs, and eventually on the right ventricle. When there is regurgitation through the orifice, it would seem, at first sight, that a certain increase of capacity would be needed to make up for this loss, and part of the force of the left ventricle will be wasted or misdirected in driving blood backwards as well as forwards. Primarily, however, there exists no mechanical cause of dilatation, and the provocation to hypertrophy is but slight. Even this will be wanting in obstructive disease. Accordingly, in mitral regurgitation, we do not find any considerable degree of dilatation, or hypertrophy in the left ventricle, and in mitral constriction there may be contraction. A moment's consideration will show that increased capacity and strength of this cavity would by no means have the same effect in mitral as in aortic regurgitation. In the latter condition, so long as the mitral valve is competent, the result is that a larger volume of blood is thrown into the aorta at each systole; in the former, the increased amount of blood contained by the dilated ventricle would be divided between the aorta and the auricle, and a part of the increased force would be expended on the lungs. The auricle, however, becomes dilated and hypertrophied, as a result of the backward pressure, and this extends backwards through the lungs, and is felt by the right side of the heart, which becomes hypertrophied, often to a remarkable degree. It is difficult to understand how the pulmonary vessels and capillaries can resist the tension to which they are exposed; but it cannot be doubted that the right ventricle, by the additional force it exercises, aids in supplying the left ventricle with blood. This I look upon as a compensatory action of considerable importance. The increased pressure will send the blood more rapidly through a constricted orifice, and will tend to diminish the amount of regurgitation when the valve is incompetent. The thin walls of the right ventricle, however, readily yield to a distending force; and a frequent consequence of this is regurgitation through the tricuspid orifice, a provision which postpones the occurrence of pulmonary apoplexy.

I think it will be evident from the considerations adduced, that the relations between valvular and associated structural alterations is one of cause and effect; and I am convinced that both will be better understood, and their bearing on prognosis better appreciated, if, instead of looking upon their combinations as valvular disease of altogether uncertain amount, complicated by hypertrophy and dilatation of independent and accidental origin, or the converse, the hypertrophy and dilatation are regarded as the direct results of the valvular affection, and as measuring the degree of mechanical difficulty occasioned by the obstruction or incompetence.

It further seems to me clear that, on the whole, these changes, dilatation as well as hypertrophy, tend to neutralise the mechanical obstruction resulting from the imperfect action of the altered valves, and are thus distinctly conservative.

A valvular murmur, then, accompanied by hypertrophy, or dilatation, or both, is still attended with greater danger than a similar murmur not so accompanied; not, however, because the hypertrophy and dilatation add new

elements of danger, but because the valvular change causing the murmur gives rise also to mechanical difficulty of serious character in the one case, and not in the other.

If, in addition to the disease in the valves, there be degeneration of the muscular substance of the heart, the dilatation may be taken as expressing the relation between the mechanical difficulty and the power of the heart to cope with it.

At the point which we have now reached, we may consider the prognosis of those cases in which valvular murmur exists, but without any apparent effects, the health and strength remaining good; and it must be remembered that, in heart-disease especially, prognosis includes not only the signs of approaching evil, but the probabilities of continued immunity.

When with the valvular murmur there is no change in the form or volume of the heart, or derangement of its action, it may be concluded that the valvular mischief is slight and unimportant. If, further, it be known to be of old standing, and to have been caused by acute endocarditis, the probabilities are, that it will not shorten life, will give rise to no symptoms, and have no ill effect whatever on the health. If, on the other hand, the murmur be recent, and have come on late in life, the same hope cannot be held out; it may indicate incipient degenerative change, and the progress of this change will determine the future of the case. Careful observation of the murmur from time to time, and of the state of the heart's walls and cavities, will be required in order to arrive at a safe prognosis.

When the murmur is accompanied by evidence of structural alteration, a cause for this exists in mechanical difficulty occasioned by the change in the valve. The seat and character of this difficulty are to be taken into account, and the order of relative gravity of the different valvular affections must be borne in mind; but we look chiefly to the condition of the walls and cavities. If the amount of change be only moderate, and especially if hypertrophy predominate over dilatation, the patient, subject to the condition mentioned above respecting the stationary or progressive character of the disease of the valve, may have an indefinite term of life before him, untroubled by cardiac symptoms. But the existence of the hypertrophy shows the valvular lesion to be such as to interfere with the circulation; and it must be remembered that the compensatory arrangement may be easily disturbed. Precautions, therefore, must be taken against occurrences which would throw increased labour on the heart, such as overwork, exposure to cold, &c.; and, if complications arise, the extent of the hypertrophy or dilatation will form an important element in the estimation of the degree of danger, indicating, as it does, a pre-existing injurious tendency.

In addition to the structural condition of the walls and valves of the heart spoken of, there may be indications of its functional condition (the subject being still in the enjoyment of good health), which may be reassuring, or the reverse. It will confirm other favourable signs, if the heart's action be equal, regular, tranquil, and of moderate strength, and not readily excited to palpitation. If, on the other hand, slight causes be sufficient to give rise to hurried and violent action, or if habitually there be any considerable departure from the normal force or regularity, these are further symptoms of the serious character of the affection.

The prognosis becomes more grave with increased amount of structural change, and more especially as dilatation is associated with or predominates over hypertrophy; but these conditions, even in an extreme degree, by no means threaten a speedy dissolution, and are not inconsistent with a prolonged and comfortable existence. There is, however, an increased liability to complications from comparatively slight causes; and sooner or later a time arrives when the heart is no longer equal to the work imposed on it, and symptoms of embarrassed circulation arise. These, then, form the next element of prognosis, and, when well marked, give more definite, though more unfavourable, indications. The period of time at which they follow the occurrence of the valvular lesion is a most important point to be ascertained. The more quickly they supervene, the more serious their significance. When they

appear early, they show that the mechanical difficulty caused by the valvular incompetence has been too great for the compensating tendency of the structural changes, which thus cease to indicate its amount. They are dwelt upon with great force by Dr. Stokes, more particularly as he considers "that the number of cases in which we are warranted in making a special diagnosis of valvular disease is small." We judge of the functional as well as structural condition of the heart by its action as seen, felt, or heard, through the walls of the chest, both habitually and as influenced by various circumstances. We learn the state of the systemic circulation by the pulse, and by examining the veins and capillary circulation; and of the pulmonary circulation, by the degree of dyspnœa, and the readiness with which this is induced. But there may also be present some of the cardiac symptoms, uneasy sensation, oppression, or actual pain referred to the heart itself, low spirits and irritability of temper, pulmonary embarrassment in various degrees, from mere shortness of breath up to the terrible paroxysmal dyspnœa termed cardiac asthma, or there may be incipient dropsy. The complications which immediately threaten life are reserved for later consideration.

The heart and pulse are to be observed mainly with a view to the indications of sustained or failing power in the heart, and of sufficient or insufficient supply of blood in the arteries. Speaking generally, if the heart evince vigour without excitement, and a strong heart-beat be not contradicted by a weak pulse-wave, the effect on the circulation has not reached a point attended with immediate danger. But each of the different valvular diseases gives rise to a characteristic modification of the pulse, which must always be taken into consideration. Aortic constriction tends to render the pulse small, with a prolonged wave. Aortic regurgitation is associated with the well known visible and audible collapsing pulse. Mitral regurgitation gives rise to irregularity in force and rhythm both in the action of the heart and in the pulse at the wrist. The degree in which these peculiarities are manifested, especially when traced by the sphygmograph, may assist in estimating the amount of change in the valve; if they be not borne in mind, none but fallacious inferences would be drawn from the pulse in prognosis. When, in aortic obstruction, it becomes fluttering and irregular, and when the characteristic collapsing pulse of regurgitation ceases to be evident and is replaced by a pulse weak and frequent, the heart is failing, and unfavourable symptoms, if not present, may be expected. In mitral regurgitation, there may be extreme irregularity of the pulse; and there may be occasional contractions of the heart, which, from momentary weakness or from want of a sufficient amount of blood in the ventricles, do not reach the wrist, thus causing one kind of intermission. But so long as the arteries are, on the whole, well filled by the systole, the heart retains a degree of vigour, and, in the absence of other unfavourable indications, may be expected to carry on the circulation indefinitely. It is, indeed, astonishing how little trouble may accompany mitral regurgitation, with enlargement of the right ventricle, and an irregular and intermitting pulse; and how long life may last. When it becomes weak, frequent, and fluttering, even though more regular, or when it is altogether uncertain, the imminence of dangerous consequences is great.

The occasional abortive systole refered to is commonly, if not always, the result of varying pressure on a dilated heart in the movements of respiration. In emphysema and bronchitis, the pulse is always weaker during the laboured inspiration, and stronger during the forcible expiration, as pressure is applied to, or withdrawn from, the heart; and a sustained powerful inspiration will in any person cause the pulse to be for the moment slow and feeble; but, when the heart is dilated and weak, it feels the effect even of ordinary respiratory movements, and frequently to such an extent that a systole corresponding with commencing inspiration, or with the respiratory pause, is so far neutralised by the removal of pressure as to fail in propelling the blood into the remote arteries; or, as it has seemed to me, the expansion of the chest has acted rather on the thin-walled left auricle, preventing the blood from entering the ventricle.

To return to our subject: whatever the structural condition of the heart

and its habitual action may be, if it be liable to excitement from slight and varied causes, such as a little exertion, change of posture, moderate emotion, the taking of food or stimulants, this is an unfavourable sign.

Fulness of the veins indicates obstruction to the entry of the blood into the right side of the heart; and this again usually implies obstruction to the pulmonary circulation. Pulsation in the large veins of the neck is the most reliable sign of tricuspid regurgitation—the last in the chain of consequences tending to dropsy.

In the state of the capillaries, we find most unmistakable evidence of an obstructed or stagnating circulation. The face congested in different degrees, the cheeks of a deep or dark red, or approaching the purple in hue, with blueness of the lips and lividity of the nose; or the face may have a dusky pallor, the nose being cold and livid. The extremities, again, may be cold and purple; the colour returning slowly after pressure. It is not necessary to go fully into the signs of sluggish capillary circulation, or to point out their significance. They belong in their marked form to a late stage of the disease, and their prognostic import is not to be mistaken.

The symptoms of secondary respiratory embarrassment are of every degree of intensity, and belong to every stage of valvular affections. Shortness of breath on exertion, and especially on walking up-hill or against the wind, is common to all heart-disease; and, except when experienced in an extreme degree, is not a very serious indication. It is simply an exaggeration of what occurs to every one taking violent exercise. The simultaneous pressure on the veins by all the muscles of the body at first brings the blood to the right side of the heart faster than it can be sent through the lungs and aërated—whence the panting. If the exertion be begun gradually, or be persevered with in spite of the dyspnœa, the circulation is equalized, and we "regain our wind." In valvular disease, this takes place with greater difficulty; but commonly, except in some cases, by starting gently and not giving in to the early dyspnœa, a sufferer from this may be equal to considerable exertion or sometimes even to severe manual labour. Shortness of breath to this degree is one of the symptoms often complained of for years without marked increase; and sufferers from it may have become so habituated to it, as to be unconscious of a condition of dyspnœa which at once attracts the attention of the physician. Frequently, however, "shortness of breath" and "want of breath," as it is often expressed by patients, becomes a most distressing symptom. The sufferer may have to stop and pant a score of times in walking one hundred yards; he may be unable to lie down; and may have paroxysms of breathlessness without assignable cause. In this case the derangement of the pulmonary circulation is greater and danger imminent. Habitual cough, persistent bronchitis with watery expectoration, occasional œdema of the lungs, are signs that the obstruction is having its effect on the pulmonary structures, and premonition of what may be expected on the slightest occasion.

Commencing dropsy, which will most commonly be associated with, or preceded by, evidences of pulmonary obstruction, is a serious symptom, but of very different import in different cases. This, however, will be more fully entered into later.

It is not necessary to dwell on other symptoms, such as sleeplessness, or sleep broken by dreams, low spirits, anxiety, irritability, apprehension, which, while adding to the patient's sufferings and helping to wear out his strength, teach nothing in regard to prognosis not already known by surer signs. A careful study of the countenance cannot, however, be too strongly recommended. By certain indefinable tokens, with which we soon become familiar, we may often go in advance of more positive indications.

As to complications other than those in the lungs, whether secondary to the impeded circulation or originating in the organ affected, in the liver, gastro-intestinal tract, or kidneys, each must be set down as an unfavourable note. Most serious in renal disease, which at the same time deteriorates the blood, and imposes on the heart additional mechanical labour by obstruction in the systemic capillaries. The conjunction of cardiac and renal affections is most ominous.—*British Medical Journal, Aug.* 25, 1866, *p.* 214.

94.—EMPLOYMENT OF A NEW FEBRIFUGE—CHLORATE OF QUINIA.

By Dr. Lyons.—(Cases at the Richmond, Whitworth, and Hardwicke Hospitals, Dublin.)

Scarlatina Anginosa; Use of Chlorate of Quinia; Rapid Defervescence.—J. M., female, unmarried, aged 18, was admitted into hospital with well-marked scarlatina anginosa. The rash was very fully developed on the chest, arms, and legs, of uniform boiled-lobster tint; the pulse was 130 and very feeble, and the patient had a dull heavy look, and complained much of the throat. On examining the fauces, both tonsils, the velum palati, arches of the palate and back of the pharynx, were much engorged, of a deep claret colour, and much distress was experienced at any attempt to swallow. Both tonsils were enlarged and spongy, the crypts being filled with buff-coloured exudation, the right gland being specially engorged. The chlorate of quinia was ordered for this patient in three-grain doses every third hour; in addition to which the tonsils were washed with a 20-grain solution of nitrate of silver, and a gargle, composed of chlorate of potash, perchloric acid, syrup and water, was directed to be used frequently during the day. Wine and beef-tea were also liberally allowed. On the following day a very marked improvement in the patient's condition was observable; the pulse had improved in volume and diminished considerably in frequency; the engorgement of the throat had much decreased, and deglutition was performed with far greater ease and freedom from pain. On the fourth day defervescence was well established; the pulse had fallen to 80, the throat was quite restored to a natural condition, and the patient was in all respects convalescent. In two other cases of scarlatina, but of milder form, the chlorate was employed with very satisfactory results.

Protracted Typhus Fever; Supervention of Diphtheria on the 21st day; Use of Chlorate of Quinia; Recovery.—This patient, aged 33, passed through almost all the possible conditions and complications of protracted low typhus. The maculæ became transformed into petechiæ, which continued persistent till towards the close of the case. Involuntary passage of urine and fæces, with diarrhœal discharges and much tympanitis, formed prominent features of the case for many days; days and nights passed without an hour's continuous sleep, or even rest; constant muttering, attempts to get out of bed, general nervous tremor with constant subsultus tendinum, and tossing of the head from side to side next supervened; the pulse became exceedingly rapid and feeble, and the heart's action assumed the *tic-tac* character, the impulse being imperceptible, and the first sound faint to the last degree of audibility. The most vigorous and well-sustained stimulation by day and night seemed alone to keep the feebly flickering flame of life from being at any moment extinguished. Later on, suffocative catarrh was threatened and with difficulty averted, and the bronchial affection overcome. Finally, in the interval of the 21st and 22nd day of the disease, when some slight general amendment had been established, it was found that an extensive diphtheritic exudation of tough buff-coloured matter covered the hard and soft palate, the pillars of the fauces, the tonsils, and all parts of the pharynx within view, extending likewise to the base of the tongue, and forward on the dorsum of that organ to near the tip.

Turning the patient to a strong play of sunlight, fortunately at the time available, Dr. Lyons introduced the index finger of the right hand covered with an extemporized mop of old linen, and carefully swept off the pellicular exudation from all parts within reach; in some situations it was found so tough that the handle of a spoon had to be employed to detach it, as from the half arches of the palate and the base of the tongue. All parts within reach were then carefully mopped with the muriated tincture of iron by a piece of sponge of suitable dimensions tied on the end of an elastic sprig of wood. Dr. Lyons states that for his part he is an advocate for the careful removal, when practicable, of the pellicular exudation before the use of any topical applications. As in the case under consideration, the exudation, he affirms,

often constitutes so complete and so impenetrable a coating to the mucous membrane, that it is, in his opinion, idle to expect beneficial result or any action whatsoever from the strongest local applications, which under these circumstances cannot possibly reach the mucous surface. In the case in question, the pellicle was fully detached by the means employed, the mucous surface laid bare being exceedingly vascular, and here and there showing bloody dots of minute ruptured vessels. The muriated tincture of iron was now freely applied directly upon the affected surface, besides which the throat was repeatedly gargled with a mixture containing chlorate of potash, perchloric acid and syrup, and with such decided results that no further exudation whatever took place. The patient was further directed to take the chlorate of quinia in about five-grain doses every third hour, according to the following formula:—

℞. Chloratis quiniæ, ʒ iss.; acidi perchlorici, ʒ ii.; syrupi auranti, ℥ii.; aquæ distillatæ, ad ℥viii. M.

Sumat. ℥ss. 3tiis horis.

The gargle employed in this and the previous case consisted of two drachms of chlorate of potash, two drachms of perchloric acid, three ounces of syrup and five ounces of water. Under the use of these remedies, the patient rapidly improved, and about the 28th day from the first invasion of the fever convalescence began to be fairly established, and continued permanent.

From the powerful oxidising and general stimulating agency of chloric acid, and the influence of quinia as a nervine-tonic, Dr. Lyons has been led to the idea of combining these two remedial agents with the view of obtaining a febrifuge medicine of great potency. Each atom of the chlorate will provide, it may be expected, five available atoms of oxygen from the chloric acid, chl. O_5, while in the perchloric acid, each atom contains seven of oxygen, chl. O_7.

From some half-dozen cases in which he has as yet employed this drug, including scarlatina, typhus, the diphtheritic case above mentioned, and low forms of pneumonia, Dr. Lyons has obtained results which so far satisfy him of its efficiency and utility, and he invites the co-operation of his professional brethren in testing the value of this salt of quinia in low pyrexial states.—*Medical Press and Circular, May* 30, 1866, *p.* 562.

95.—GUFFROY'S COD-LIVER EXTRACT.

The inventor of this preparation, which is coming into considerable use in London and elsewhere, proceeds on the hypothesis that the active medicinal principles of the cod-liver oil are to be found in the greatest abundance in the watery constituents or serum of the liver, which he has converted, by his process of sugar-coating, into an attractive preparation. He claims for his Cod-liver Dragées that they contain all the beneficial ingredients of full doses of cod-liver oil, and being of very small bulk and perfectly tasteless, they completely obviate the objections which bar the use of that agent in the cases where it is most wanted. We take our information from an explanatory pamphlet issued by the manufacturer, whose statements must stand *quantum valeat*:—

"Many persons, thinking that the nausea caused by the oil was to be attributed to the colouring empyreumatic matters contained in the common cod-liver oil of commerce, recommended the use of refined and colourless oils; but the slight advantage which was thus obtained in rendering the oil less repulsive was by many thought to be more than counterbalanced by a loss of remedial virtue. Others, less happily inspired, proposed to administer the oil in the form of jelly, but that also failed. It was then attempted to render the oil less unpalatable by enclosing it in gelatine capsules, but little thereby was gained, since the gelatine in no way tended to promote the retention of the oil by the stomach. Some, again, have tried to produce an artificial cod-liver oil, by imitating its chemical composition. . . . . It was evident

that the composition of a complex organic product like the oil in question could not be successfully imitated by any artificial compound. But it was equally clear that whatever virtues cod-liver oil possessed, over other animal oils and fats, were referrible to the source from which that article was procured—namely, cod-liver. . . . . The inventors had noticed that the substances to which the best authorities attributed the medicinal properties of cod-liver oil—namely, gaduin, propylamine, iodides, bromides, and phosphates—were more soluble in water than oil; and as cod-liver contains a larger proportion of water than in oil, they formed the opinion that the watery components of the livers must carry off the greater part of those substances. Chemical analysis, followed by practical observations, fully confirmed these theoretical views. It has been distinctly proved that the oil contains but a very small part of the medicinal elements existing in cod-liver and that the greater portion is left in solution in the waters which have hitherto been thrown away.

"This important discovery once made, it only remained to reduce the watery constituents of the livers to a proper officinal form, in order to possess a medicine containing the active principles of cod-liver, separate from the oil. That of extract was adopted as the most suitable. The waters were accordingly evaporated, and were found to yield a product which, on being analysed by Dr. Garreau, Professor of Chemistry in the University of Lille, proved to have the following important chemical constitution:—

Ichthyoglycine	50·000
Propylamine	2·545
Acetic, lactic, and butyric acids	6·000
Phosphoric acid	2·090
Sulphuric acid	0·200
Chlorine	1·525
Iodine	0·154
Bromine	trace
Soda	1·170
Potash	0·211
Magnesia	0·366
Lime	0·510
Ammonia	2·862
Extractive matter undetermined, gaduin, &c.	10·620
Water and loss	21·747
	100·000

"The extract thus obtained presented, however, two difficulties: in the first place, it was found to be exceedingly deliquescent, and, secondly, it was too concentrated for direct administration. These obstacles were overcome by mixing intimately with the extract about an equal weight of cacao-butter. The resulting compound was a firm and stable mass, of which pills, capable of being sugar-coated, could be made. By these means the preparation assumed the form of sugar-plums or *Dragées*.

"A proper officinal form for administering the new medicine having been found, it was submitted to the Académie Impériale de Médecine of Paris, who, in the month of May, 1861, appointed a committee, composed of Drs. Bouillaud, Poggiale, and Devergie, to examine, experiment, and report upon it.

"At the meeting of the 21st October, 1862, the Academie approved and adopted the report of those gentlemen. It will thus be seen that the deliberations of the committee extended over a period of sixteen months—a length of time which afforded ample opportunity for prolonged trials and a well considered decision.

"This report, which is too lengthy to be here given *in extenso*, recognizes the accuracy of the analysis of Dr. Garreau of Lille, and deduces from it a comparison of the proportion of chemical elements contained in the extract, with that found in oil of the best quality. According to this comparison,

cod-liver oil contains scarcely 3-1000th of the elements iodine, sulphur, chlorine, and phosphorus, while the extract possesses 98-1000th of the same elements, or their acids, thus showing thirty-three times the amount; and while, from the oil only, about 10-1000th extractive matter can be obtained, cod-liver extract yields 724-1000th, or seventy-four times more.

"'If,' continues the report, 'chemical composition be taken as the measure of the comparative value of cod-liver oil and cod-liver extract, it must be admitted that twenty centigrammes represent nearly forty-five grammes of oil, or more than two tablespoonfuls. . . . . The extract obtained from cod livers contains, in a condensed form, all the active therapeutical principles of cod-liver oil. . . . The system under its use acquires more vigour, the appetite gradually returns, the complexion improves, and the muscular strength increases. In short, the administration of the extract, like that of the oil, promotes assimilation, and consequently tends to the improvement of the general health of the patient. The richness of its chemical composition, its efficiency and certainty of action on the economy, the possibility of administering it to the most delicate and fastidious persons, constitute it a valuable therapeutical agent in all those affections which require the employment of cod-liver oil.'

"Cod-liver extract has likewise been tried in Russia, under the auspices of Dr. Kalenitchenko, Professor of Medicine in the University of Karkow; and has been officially recognised and authorised by the Imperial Medical Council of St. Petersburg."

The course adopted by the patentee of this preparation is such as to merit, *ab initio*, the confidence of the profession. He has not desired or attempted —as others have done—to force the medicine amongst the general public, but has simply submitted it to the profession on its own merits. He expresses a hope that medical men will be induced to give it a fair trial; if they find it meet their expectations, prescribe it regularly; if not, reject it summarily.

With reference to its employment in practice, he says:—

"Possessing, perhaps, in a higher degree than cod-liver oil itself the peculiar remedial properties of that substance, it is well qualified to take its place in certain cases even when the oil can be borne. But irrespectively of its claims in this respect, the full value of which enlarged experience can alone determine, cod-liver extract specially recommends itself in the following circumstances:—

"1. When the oil is rejected by the stomach.

"2. When, although the oil is not actually refused by the stomach, the production of nausea and disgust renders a change of remedies very desirable.

"3. When, without discontinuing the oil, there may be reason for wishing to increase its efficacy.

"4. When the oil, whether agreeing or not with the patient's stomach, has failed to produce beneficial results.

"These objects may, according to circumstances, be attained by prescribing the extract alone, by administering it along with some oily matter less nauseating than cod-liver oil, by alternating its administration with that of the oil, or by giving it at the same time with the oil, and thus, as it were, enriching the latter substance with a superadded dose of those more active principles, in which cod-liver oil is deficient."

We will not be expected to give an authoritative opinion here as to its merits. Theoretically it is simply a question of what the benefit derived may be due to. If it be simply the oil itself, it appears rather inconsistent to prescribe cod-liver instead of many less nauseating oils. If it be the Iodine, Ichthyoglycine, Propylamine, or other correlative ingredients, the inventor has, we think, proved his case.

We are not certain that Mr. Guffroy has been judicious in labouring so energetically to make the medicine pleasant to the taste, for the profession in Great Britain seem to look coldly on the Dragées and Troches of the French Pharmacy. If it is any inducement, we may say that the cod-liver extract, before it has received the coating of sugar, is as unpleasantly

fragrant a preparation as could be desired.—*Medical Press and Circular, Aug.* 1, 1866, *p.* 127.

96.—ON THE TREATMENT OF GOUT BY HYDROCHLORIC ACID.

By Dr. JAMES F. DUNCAN, Physician to the Adelaide Hospital.

There are many points of resemblance between gout and rheumatism. Both are marked by high fever, by a painful affection of the joints, and by a tendency to sudden changes of situation in the seat of pain. Both diseases seem to depend upon the presence of an abnormal acid in the blood, the production of which in each instance depends upon imperfect oxidation of the blood and more or less impaired nervous energy as the cause of that imperfect oxidation. The presence of lithic acid in the blood, in gout, has been proved incontestably by Dr. Garrod—and no one can doubt, after the experiments made by Dr. Richardson, of London, that lactic acid is the efficient cause of the peculiar phenomena of acute rheumatism.]

Assuming for the present as a matter of fact that the blood in gout is charged with lithic acid to an extent far beyond the natural standard of health, and in rheumatism with lactic acid, let me proceed very briefly to state to you my views as to the production of these different conditions, and the principles of the treatment you have seen me use for their mitigation and removal.*

I shall not occupy your time with any detail as to the various theories which have been held by different authors on this subject, as you will find them sufficiently explained in the text books in common use. I shall only advert to that broached by Dr. Garrod in his recent work, which may justly be regarded as the standard authority of the present day. And while I feel that, in venturing to differ from one enjoying so high a position as a practical physician and a man of science, I am taking a bold step, I feel at the same time that I would be wanting in my duty to you if I did not put you in possession of the opinions I have been led to form after careful study upon this subject, and of some of the facts upon which those opinions have been founded.

Dr. Garrod looks upon the kidney as an organ whose function is merely to separate from the blood certain principles which exist in that fluid already, and which, having served their purpose in the economy, are no longer necessary to be retained, and which, if retained, would prove positively injurious. He does not consider that the kidney manufactures by its own inherent power these principles out of the blood, but that they are already in the blood in the form in which they come to be eliminated, and only require to be separated from the fluid in which they are dissolved by a sort of elective affinity. In other words, that the function of the kidney is one of excretion and not of secretion. Urea and uric acid are two of these principles.

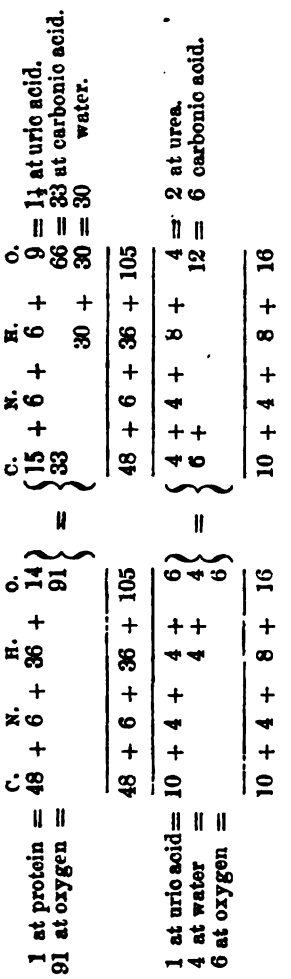
Now, in reference to these two products, he considers that they have no necessary relation to each other, and that the power of excreting one may be maintained in full energy, while that of excreting the other may be diminished or arrested. In gout he considers that the excretion of lithic acid is impaired just as the excretion of urea is impaired in Bright's disease. The latter position is too well known to be disputed. and a careful examination of the cases in Dr. Garrod's work establishes beyond all question that the quantity of lithic acid excreted during the paroxysm of gout is, as a matter of fact, greatly diminished. The consequence is that the lithic acid, if its formation in the blood continues to take place, must rapidly accumulate in that fluid. Accumulating here, it acts as a poison and gives rise to all those symptoms which characterise the phenomena of a gouty paroxysm. (See Dr. Garrod's work, p. 339.) "Gout," to use his own words, "would thus appear partly to depend on a loss of power (temporary or permanent) of the acid excreting function of the kidneys; the premonitory symptoms, and those also which constitute the paroxysm arising from an excess of this acid in the

* See a paper on this subject in the Dublin Quarterly Journal for May, 1866.

blood, and from the effort to expel the materies morbi from the system. Any undue formation of this compound would favour the occurrence of the disease; and hence the connexion between gout and uric acid, gravel, and calculi; and also the influence of high living, wine, porter, want of exercise, &c., in inducing it."

The objection I take to this explanation is this, that while it may be sufficient to account for the symptoms after the paroxysm is formed, it gives us no help to explain the cause of the loss of that uric acid excreting function in the first instance.

Let us now proceed to set before you the views I have been led to form on this matter. Adopting the idea broached by Liebig, that the protein compounds of the body, in the disintegration of the effete tissues, are converted, through the agency of oxygen, first into uric acid and then into urea, as shown in the diagram (see below), it will follow that if by any circumstances the necessary degree of oxidation be not reached, the metamorphosis will be arrested in the state of uric acid, and this substance, which ought to be met with in very small quantity, will be proportionately augmented. I take it for granted that the removal of the nitrogenous compounds from the body after they have served their purpose in the economy, is naturally and principally effected in the form of urea rather than of uric acid, both on account of the much greater quantity of urea habitually found in the urine and from its great solubility.


1 at protein = C. 48 + N. 6 + H. 36 + O. 14
91 at oxygen = 91
1 at uric acid = C. 10 + N. 4 + H. 4 + O. 6
4 at water = 4
6 at oxygen = 6
2 at urea. C. 4 + N. 4 + H. 8 + O. 4
6 carbonic acid. 6
1¼ at uric acid. C. 15 + N. 6 + H. 6 + O. 9
33 at carbonic acid. 33 + 66
water. 30 + 30
C. 48 + N. 6 + H. 36 + O. 105
C. 10 + N. 4 + H. 8 + O. 16
C. 48 + N. 6 + H. 36 + O. 105
C. 10 + N. 4 + H. 8 + O. 16

But it is not only from the disintegration of the albuminous tissues that uric acid may be thus formed. It is obvious that precisely the same changes may take place in the primary assimilation of protein compounds used as food, and I need scarcely tell you that the great majority of animal substances used for food are really but modifications of the elementary compound which has been designated protein. We have hence naturally two sources of uric acid in the system, one which may be considered almost constant in its amount, arising from the metamorphosis of tissue undergoing disintegration, and another variable quantity arising from the greater or less amount of nitrogenized food consumed by each individual. And in proof of this I have only to refer you to the diagram on the wall, which shows the marked influence which diet has upon the function of the kidney, augmenting both the urea and the uric acid when the food is exclusively animal, diminishing them when it is partly animal and partly vegetable, diminishing them still more when it is exclusively vegetable, and making them least of all when a diet is selected from which every atom of nitrogen has been carefully excluded.

Now, I need scarcely remind you that gouty patients are met with principally among that class of society who feed well, consume much animal food of the richest and most nourishing kinds. Here, then, we have one source of the production of uric acid in excess. Not necessarily I admit, for if the person who indulges in food of this description takes much exercise in the

open air, and pursues some laborious occupation to work off the nutriment as rapidly as it is taken, the balance between the functions may be preserved and no harm follow. But if, on the contrary, he be a person of studious and sedentary habits, who takes little exercise and is not much in the open air—in whom, in fact, the function of respiration is only kept up at an average amount, it is plain that the oxidation in the lungs being insufficient to convert all the uric acid which is formed into urea, an accumulation must take place, to prove a source of subsequent discomfort and disease. But this is not the only source of mischief in these cases. I conceive that one of the causes of the increased production of uric acid is to be found in the imperfect or insufficient manner in which the function of respiration is performed, owing to the disturbed state of the digestive system. This is a point altogether overlooked by Dr. Garrod, which, if there be any truth in the chemistry of vital processes, must be regarded as of the greatest importance. You all know that the pneumogastric nerve is distributed to the lungs and to the digestive organs, and that its integrity is equally necessary for the healthy performance of both sets of functions. This being so, it is not unreasonable to suppose that whatever tends to concentrate unduly the nervous energy of this nerve in one of these two directions must, *pro tanto*, interfere with its efficiency in the discharge of its functions in the other. If the alimentary canal be overloaded at any time with food beyond what the gastric juice can conveniently assimilate, and still more if that food be of an indigestible quality, causing the process of digestion to be protracted and difficult, the function of respiration must suffer. And here I would remark that the only test of the efficiency with which the process of respiration is effected, is the amount of carbonic acid exhaled in a given time. It is quite possible for the mere act of respiration to be accelerated, while the proper duty of the lungs is not performed up to the standard of health. The chemical changes in the blood may not be consummated notwithstanding the increase in the frequency of the acts of inspiration and expiration. Indeed, so far is this the case, that that very increase may be only Nature's effort to compensate for defective results, just as we know that the heart, when weakened by disease, endeavours to make up for its impaired energy by a quicker circulation.

I am not aware that any experiments have been made to set this question at rest by ascertaining the amount of carbonic acid exhaled by the lungs when the stomach is loaded and when it is empty; but it could easily be accomplished, and I have no doubt what the result would prove. It is an ascertained fact, that when the body is exposed to a high temperature, as in a warm climate, the quantity of carbon thrown off by the lungs is diminished, and this is one of the causes of hepatic disease in tropical districts, because a greater amount of this substance is left for removal in the shape of bile in consequence of this diminished exhalation of carbonic acid; and the same thing happens as a consequence of using alcohol—a circumstance which, taken with what has been said, may help to explain the production of gout in persons of intemperate habits, especially those who use alcoholic liquors which contain various forms of vegetable extracts, because the latter disturb the function of digestion more than others that are only so many kinds of dilute alcohol. Now, it is scarcely necessary for me to prove that the function of digestion is very materially disturbed in every case of gout. Sometimes this disturbance seems to be merely the result of impaired nervous energy which shows itself in the secretion of an inferior quality of gastric juice, so that persons of abstemious habits are often martyrs to a disease that is commonly understood to be caused by indulging in the pleasures of the table, but which, in their case, owns no discreditable origin. But most frequently the fault is not in the organs that suffer, but in the bad usage they are exposed to, more work being thrown upon them in the quantity and quality of food taken than they are capable of performing. If proof of this position were needed, we have it in the foul breath, the loaded tongue, the nausea and sense of weight in the stomach, the flatulence that most gouty patients are subject to, and still more in the common interval observed to take

place between the time at which an error of diet has been committed and the development of the actual paroxysm.

You will now, I dare say, easily be able to catch the views I have been led to entertain regarding this affection: a disordered digestion is the primum mobile of the whole train of morbid phenomena. This leads to imperfect performance of the function of respiration; this, again, to imperfect oxidation of the protein compounds in the blood, whether of primary or secondary origin; and the consequent accumulation of these products in the form of uric acid. This accumulation again leads to the special symptoms of the gouty paroxysm, general disturbance of the entire system, suspension of the function of the kidney, and further augmentation of the materies morbi in the blood by its non-elimination at the proper channel.

This, of course, is but a very imperfect sketch of the subject, but the time at our disposal does not admit of my entering upon the discussion more fully at present.

Now for the treatment you have seen me in the habit of pursuing in these cases. It is simply the free use of hydrochloric acid, either alone or differently combined. The principle upon which I suppose it to act is not that it supplies oxygen to the uric acid to convert it into urea, but that it increases the digestive power of the gastric-juice, enabling the stomach more readily and effectively to accomplish the process of assimilation, and so indirectly increasing the nervous energy as to effect more perfectly the vital changes in the chemical constitution of the molecules of the blood, which are necessary to prevent the occurrence of this disease.

It is scarcely necessary for me to tell you that this remedy is entirely at variance with all the plans of treatment hitherto in use for the cure of gout. Alkalies, in some form or other, to neutralise the lithic acid, and especially those alkalies or alkaline earths, which, entering into combination with this acid, will make salts of ready solubility, have been the fundamental supports of every plan that has met the approval of the profession. Other remedies have been used, but they were either ancillary to alkalies as the sheet anchor, or were employed for some special purpose. I do not put forward the hydrochloric acid as a specific to be used under all circumstances and in every stage of the disease, neither would I mean thereby to exclude the use of such other agents as may be obviously demanded to meet special contingencies. All that I contend for is, that it seems to me to act more directly upon the primary cause of the disease and to hold out greater prospect of effecting a real cure than any antacid remedy I know of. I shall now give you the particulars of the last case we have had under our care, briefly condensing the notes made by my clinical clerk, Mr. Reilly, not to exhaust your patience by too great a detail. I do so with the more pleasure because of its undoubted character as a true case of gout, of the severity of the symptoms, and of the fact that he was put upon the use of the acid from the first, which gave him immediate and permanent relief.

George H., an Irishman by birth, who had passed most of his life in England, was admitted into the Adelaide Hospital, Dublin, March 8, 1866. He was thirty-seven years of age, by occupation a land-surveyor and leveller, and as such constantly exposed to the weather. He always lived well, eating meat and cheese at least three times a day, and drank pretty freely, preferring ale to porter or spirits. He was quite free from disease until eight years previously, when, in consequence of a severe wetting, he was laid up for four weeks with swelled ankles, the joints of his toes especially, the great toes being also affected. He had three subsequent seizures, in which his feet and ankles alone were engaged. These occurred at intervals of three months; his knees afterwards became implicated, and later his wrists and fingers. Formerly he was accustomed to have an attack four times a-year, but latterly they had become much more frequent, supervening upon the least exposure to cold or damp. The joints were always of a bright red colour, and afterwards desquamated. The family history was perfectly healthy, and his digestive powers appeared unimpaired. Five days before his admission, in consequence of a wetting, he was again attacked, when all his joints were

more or less affected,—his ankles, toes, wrists, and fingers being particularly implicated. These parts were hot, red, swollen, and very sensitive. He had to be carried up stairs to bed, being unable to stir either hand or foot; he was sweating profusely; his urine scanty and acid; his tongue white and furred; the bowels open; his pulse 90. Large tophi existed on each knuckle, which were very red and inflamed. Several well-marked concretions were observable on each ear, but they were not painful or tender to the touch.

℞. Acid. hydrochloric. dil. 3iss.; sp. chloroformi, 3ii.; tinct. colchici, 3i.; infus. cascarill. ad. ℥viii.

Sumat. ℥i., 3tiis. horis sing.

March 9th. Much better; countenance clearer, less expressive of suffering; slept well; pains much diminished, particularly in the ankles; pulse 72.

10th. Pains in wrist and fingers better; sweating continuous.

11th. Still improving; quickly regaining the use of his wrist and fingers; no pain in the lower extremities, except on attempting to move them.

14th. All his joints free from pain; able to move without inconvenience, except from weakness in his ankles; sweating diminished; tophi uninflamed and getting smaller, though still slightly tender; pulse 62; tongue clean; appetite good; urine alkaline. Ointment of iodide of potass to be applied to tophi; continue his mixture.

24th. Quite well; able to walk and write with his usual ease; complained of weakness. Ordered quinine mixture, the hydrochloric acid being stopped.

25th. Pains again troublesome; bowels confined; tongue red. Omit quinine mixture; to have an oil draught.

27th. Left the hospital at his own request to follow his occupation.

This case did not appear to require any preliminary treatment before having recourse to the remedy which I here recommended. It was essentially one in which the vital energy was depressed, where a tonic line of treatment was particularly called for; so far as I have yet had the opportunity of forming an opinion, it is in cases of this class it is most eminently useful. Some persons may suppose that the improvement was due to the colchicum which, you know, is generally considered a specific in gout and which was combined with it. But without attempting to undervalue the utility of this much vaunted remedy, my experience, from other cases in which the acid was tried alone, leads me to conclude that a very important part of the benefit is to be attributed to the acid, and having already shown this in other cases when the acid was tried by itself, some of which were recently in the hospital, I do not see why I should throw overboard a combination of two useful medicines in a suitable case merely to establish the reputation of one of them, which happens to be less generally known. I also added spirit of chloroform as a carminative, to check the tendency to the generation of flatus in the intestinal tract, and infusion of cascarilla as a general tonic. The only inconvenience he experienced from the treatment was a slight diarrhœa on the 20th of the month, which did not require a change of the medicine, but merely a reduction in the dose. Any of you who saw the helpless condition of the patient on his admission, the expression of pain depicted on his countenance, and the sensitiveness with which he shrunk from even an approach to the bed clothes near the inflamed parts, cannot fail to have been struck with the marked and immediate improvement under the treatment, and especially at the change in the appearance of the tophi from what they were at first—instead of being red and swollen they diminished in size, and lost all that angry look that they presented on admission. In conclusion, this I can say with confidence, the theory I now broach may be wrong, but the treatment is pre-eminently safe and beneficial.—*Medical Press and Circular, May* 2, 1866, *p.* 443.

97.—ON A CASE OF HEART-DISEASE.

By Dr. Hyde Salter, F. R. S., Physician to Charing Cross Hospital.

The patient was brought to the hospital suffering with extreme shortness of breath; he was only able to speak in short and broken sentences; had a

mingled expression of anxiety and exhaustion; and a certain sallow, almost jaundiced, tinge in his skin. He gave us with some difficulty (partly from his breathlessness, partly from his drowsiness and exhaustion) the following history.

Robert Lunt, aged 35, single, by occupation a sailor, has enjoyed unbroken health up to fifteen or eighteen months ago, when he had rheumatic fever; it affected every joint in his body, and confined him to his bed for three weeks. During the attack, he suffered, for the first time in his life, from great palpitation of his heart, severe pain in the præcordial region, and dyspnœa. His heart beat so strongly that he could hear it as he lay. When the attack came on he was on board ship, outward bound on a voyage to Australia. After he got into warm latitudes he convalesced pretty quickly, and was gradually able to resume his duties. At Bombay, four months after, he was again attacked with palpitation; which, however, lasted only an hour. Up to three months ago, on the voyage home, his breath was pretty good, and he was able to climb the rigging without inconvenience; but since he has been home it has failed, and he has suffered from loss of appetite and languor. About six weeks ago shortness of breath came on, and has never left him since. The difficulty of breathing renders it impossible for him to lie down; as soon as he attempts his breath is gone, he feels choked, and is obliged immediately to sit up. It also prevents all sleep, even in the erect posture. For the last week, he states that he has not had a wink of sleep, day or night; and his friends corroborate his statement. He feels drowsy and sleepy—overwhelmed with sleep, in fact; but he cannot get a moment's slumber, on account of the dreadful breathlessness that immediately attacks him. Just as he is dozing off, he "chokes," as he expresses it, and is wide awake in a moment. The slightest exertion, too, aggravates the dyspnœa so much that it is insupportable; he cannot cross the room, cannot even get out of bed or into it, without assistance. The breathing is worse after food, proportionately to the quantity eaten. He has had no cough. A day or two after the shortness of breath came on, he began to spit blood; the blood was clotted, black, and in pellets, unmixed with phlegm, and not frothy. He would spit it a dozen times, perhaps, in the twenty-four hours. Appetite bad; bowels confined; urine scanty, high coloured, and not albuminous.

On examining the chest, we found crepitant ronchus in patches here and there, especially in the upper part of the right side in front. Breath-sounds in other respects perfectly natural. Heart-sounds natural, except that the first sound was dull and defective. Pulse 84; respiration 30.

Now, before going any further, let us just stop to inquire what diagnosis could be constructed out of these materials, and what diagnosis actually *was* arrived at.

In the first place we came to the conclusion that the heart was hypertrophied. Its action was heaving, the distribution of its impulse was extended, and the area of cardiac dulness was too wide; at the same time, the first sound was dull and obscure; and this fact had all the more significance from the other facts—from the defective sound being associated with so strong an impulse and with a full pulse.

In the second place, we came to the conclusion that there *was* some valvular mischief, in spite of the absence of any *bruit*. And why did we come to this conclusion? Simply because the symptoms appeared all to start from rheumatic fever. The great value and indicativeness of this fact cannot be over-estimated. The man had the first attacks of short breathing he had ever had in his life during the rheumatic fever; there can be no doubt from the symptom he suffered from—præcordial pain and palpitation—that his heart was then affected. Since that time he has suffered from repeated attacks of palpitation, and now he has manifest symptoms of hypertrophy. Now, taking those two points—rheumatic fever as the cause and hypertrophy of the heart as the result—what is the *tertium quid* that connects them? If rheumatic fever produces hypertrophy of the heart, by what agency does it do so? The only way that I can conceive is, by organically damaging the heart's valves and orifices. Unless the rheumatic fever leaves some organic trace behind

it, one does not see why, or how, it should ultimately give rise to cardiac hypertrophy—the mere fact of rheumatic fever having occurred could not produce it. Taking for granted, therefore, that the hypertrophy of the heart was primarily due to the rheumatic fever, I could not but conceive that thereby valvular disease was inevitably implied. What, then, did this bring us to? Valvular disease without a *bruit*.

And this brings me to the third point in our gradual narrowing of the diagnosis; namely, What particular valvular disease was that most likely to exist here? what valvular disease would be most compatible with absence of *bruit*, and with the other symptoms of the case? We conclude it to be *mitral narrowing*. There can be no doubt that mitral narrowing often does exist to a considerable extent without giving rise to a murmur, if the narrowing be unaccompanied with irregularities or asperities of orifice; and this is probably due to the feebleness of the force by which the blood is impelled (auricular systole) and its consequent feeble murmur-generating power. There can be no doubt, too, I think, that mitral narrowing has a greater tendency than any other valvular lesion to give rise to hæmoptysis, also a feature of this case.

My diagnosis, then, was some smooth narrowing of the mitral orifice, sufficient to give rise to considerable obstruction to the transit of blood through the left side of the heart, but not sufficient to generate a *bruit*.

Now, I have been at pains to give you the steps of my diagnosis and my reasons for them; for I do believe that it is only in this way—by examples, by shewing you individual instances of the application of its rules—that the art of diagnosis can be taught.

Before I tell you what the *post mortem* examination revealed, let me just finish the history of the case, which may be done in a few words.

After his admission into the hospital, no mitigation took place in the patient's symptoms. The urgent dyspnœa, especially on attempting to lie down, to sleep, or to move, continued. Day after day and night after night, he got no sleep, though begging and praying for it. To his sleeplessness was added now increasing restlessness, which greatly aggravated his distress. He would not remain in the same position two minutes together. At one moment he was in bed, the next out of bed, the next in bed again. As this restlessness increased, his drowsiness became exchanged for an apparent incapacity for sleep, and his manner had something the aspect of that of a patient suffering from incipient *delirium tremens*. Indeed I have no doubt that his condition did approach to that of delirium tremens, and that his restlessness and vigilance were due to the extreme exhaustion produced by the many exhausting influences that were telling upon him. There was the exhaustion of his sufferings, the exhaustion of his sleeplessness, the exhaustion of want of food (for he took nothing), and the exhaustion of the hæmoptysis. And to these was added a much more potent source of exhaustion, that I have not yet mentioned to you. After he had been in the hospital two or three days, he was attacked with profuse bleeding of the nose, which was so profuse and so ungovernable that, after many remedies had been tried and failed, both nostrils were obliged to be plugged. In spite of this, he lost blood largely every day, and became quite blanched and anæmic. You must all of you remember the ghastly appearance of the man, with his haggard expression, his white face, his plugged nostrils, and blood-bedabbled linen. The nostrils remained plugged up to the time of his death, for every day the bleeding burst out afresh.

Now, what was the meaning of this profuse and persistent epistaxis? I am inclined to think that it bore the same interpretation as the hæmoptysis—that it was due to the giving way of vessels that had become congested and distended in consequence of the impediment at the heart retrograding upon them. You know how surely heart mischief in this way ultimately produces systemic venous stasis: indeed, that this and its attendant results constitute some of the most marked symptoms toward the close of cardiac cases. That the heart mischief had produced this result in our patient the œdema of his legs showed; and that the epistaxis, although due to the same

cause as the hæmoptysis, did not supervene till some time after it, is quite explicable by the relative position in the circulation which the two seats of hemorrhage occupied; for it would take some time for the impediment first felt at the pulmonary vessels to retrograde as far as the systemic venules. It is very possible that the tendency of the vessels to give way under the increased pressure of their contents might have been in this case assisted by a hemorrhagic tendency, which I have over and over again seen associated with the rheumatic diathesis. I do not say that the hemorrhage was positively caused in the way that I suggest, but I think it extremely probable. Indeed, considering how easily the venous plexuses of the nasal mucous membrane give way, and what conspicuous evidence we often see of venous turgescence in heart-cases, it seems to me more remarkable that epistaxis should not oftener occur in such cases than that it ever should. I do not know, however, that I have ever seen bleeding of the nose mentioned as a recognised occurrence in the course of cardiac cases. If this man's epistaxis really depended on the impediment to the circulation that the heart-disease offered, it would explain why it so resisted all attempts to stop it, because it was the result of a persistent and constantly acting cause.

The closing scene of the case was in this wise. The night before last (having been thirteen days in the hospital), the man was seized, without having appeared worse on the previous day than usual, except that he was weaker, with a more violent paroxysm of dyspnœa than he had before experienced: he felt as if he was dying. Similar paroxysms recurred throughout the night, getting more and more severe; and at length in one of them he died.

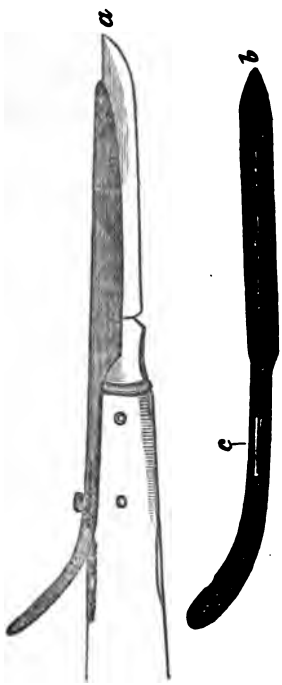
On making the *post mortem* examination just now, we found one of the largest hearts I ever saw; it might truly be called a "bovine" heart. It reminded one more of the ox-hearts we see hung up in butchers' shops than of anything human. The wall of the left ventricle was one inch and three-eighths thick; I measured it myself. The right ventricle was half an inch thick; and the auricles proportionately thickened. So far we found what we expected—the heart was, as we diagnosed, greatly hypertrophied. We then cut into it to see the valvular disease on which all this hypertrophy probably depended; and what did we find? *Every valve of the heart perfectly healthy!* There was nothing but a slight patch of opacity on one of the curtains of the mitral valve, that could never have interfered with its action. Now here was a strange thing!—perfectly compatible with the absence of *bruit*, and so far satisfactory, but subversive of our hypothetical diagnosis, and leaving the hypertrophy utterly unexplained. Here was a case of enormous hypertrophy without valve-disease, without lung-disease (the lungs were perfectly healthy), and without kidney disease. I may mention, too, that the pericardium showed no trace of disease. Such cases are not common, but we sometimes see them, and they are among the puzzles of pathology. Perhaps the most curious thing is that, although the heart-symptoms that ended in this hypertrophy commenced with rheumatic fever, there should be no evidence of the ordinary agency by which rheumatic fever generates hypertrophy of the heart. Could it be that the patch of slight opacity on the mitral valve could be the remains and indication of a former valvular lesion, sufficient when recent to have started the deranged action which gave rise to the hypertrophy? I cannot think it. The mind is baffled in seeking an intelligible solution of so difficult a problem.

In the way of treatment, there was little to be done. The great means of alleviating the cardiac embarrassment in cases of this kind—hydragogue catharsis—was in this case inadmissible from the man's exhaustion and the many weakening influences to which he was subjected. If we had dared to give him twenty grains of compound scammony powder every morning, and had thus draughted away from his bowels six or eight abundant watery stools, we should for the time have reduced the volume of the blood to be circulated and so disembarrassed his heart.

The only thing to be done, besides using every means to stop the hemorrhage, was to endeavour to keep him up in every way—by food and stimulants, especially alcoholic. Food we had the greatest difficulty in getting

him to take. The condition of his circulation and respiration prevented our employing sedatives to procure him rest. Thus our hands were tied in every way, and there was little left for us to do, but to stand by and watch the inevitable and fatal issue.—*British Medical Journal, July* 28, 1866, *p.* 89.

98.—A NEW INSTRUMENT FOR TRACHEOTOMY.



We may notice an ingenious little instrument which has been contrived by Mr. WORTHINGTON, late House-Surgeon to the Middlesex Hospital. Its object is to facilitate what often proves one of the most difficult steps in tracheotomy—the introduction of the canula into the trachea. It consists of an ordinary scalpel, on the back of which lies a closely fitting, deeply grooved steel director (Fig. *a*). This director is adjusted by means of a slit (*c*), into which a button on the handle of the scalpel projects. During the early stages of the operation, and when the trachea is being opened, the director lies withdrawn upon the scalpel, as in Fig. *a;* but when the cut in the trachea has been made, and while the point of the scalpel is still in its canal, the director is pushed down beyond the point of the scalpel and detached from it (which is done very easily when the dilatation in the slit *c* is opposite the button), and left in the trachea, where it serves as a guide either for the introduction of the canula or for the subsequent enlargement of the cut in the trachea, should the one first made be of insufficient length. This instrument is so simple in its construction, and so easily managed, and aims at obviating what is often such a serious difficulty, that we have no doubt many surgeons would find advantage from its use.—*Medical Times and Gazette, July* 7, 1866, *p.* 8.

99.—ACTUAL CAUTERISATION WITH CHARCOAL PENCILS.

The *Répertoire de Pharmacie* states that it has occurred to several practitioners that the alarming apparatus necessary for actual cauterisation might, in certain cases, be replaced with advantage by small charcoal cylinders, which light and burn like a cigar. The lighted portion burns in an extent of four lines, and is terminated by a fine point, whatever the shape and thickness of the pencil.

The pencil is sufficiently solid not to break, and emits no sparks, when perpendicularly applied to the surface; if applied obliquely, its resistance is of course less considerable.

The following is, according to M. Bretonneau, a dispensing chemist of Paris, the most appropriate formula:—

℞. Pulv. carbon. populei, ʒjv.; potassæ nitratis, gr. xxx.; tragacanth, ʒj.; aquæ, ʒvj.

Prepare a mass to be rolled into cylinders, about four inches in length, and of the diameter of a common pencil. These pencils produce in burning but an insignificant amount of ash, which may be blown away in order to promote combustion.

We may observe that, for upwards of thirty years, M. Guérin has used

with much success for the same purpose agaric moxas of the size of common wafers.—*Journal of Practical Medicine and Surgery, April*, 1866, *p.* 160.

100.—THE PRESERVATION OF SULPHATE OF IRON.

Signor Pavisi recommends the following method of preserving sulphate of iron from oxidation :—Mix four parts of pure crystallized sulphate of iron, and an equal quantity of finely-powdered gum arabic, with distilled water, and evaporate the solution in a water-bath, at a low heat, till it has a sufficient consistency to be poured out on plates of glass. When it has been poured out in this way, and allowed to dry at a temperature of 30° cent. in the dark, it may be cut up into lozenges, which can be kept for any length of time in a coloured stoppered bottle.—*Lancet, June* 9, 1866, *p.* 633.

101.—OBSERVATIONS ON BRAIN SOFTENING, HEMIPLEGIA, &c.

By Dr. Alex. Robertson, Physician to the Town's Hospital and City Parochial Lunatic Asylum, Glasgow.

(Read before the Glasgow Medico-Chirurgical Society.)

That serious degeneration of a part of the body, along with partial or complete loss of function, result from sudden occlusion of the vessels on which it depends for its blood supply, and also that in some cases, though for the most part of a less formidable kind, these effects are produced by like obstruction to the return of blood from the affected organ, are facts with which the profession is familiar. Morbid changes, due to the first of these causes, viz., arterial obstruction, have been observed in various organs and tissues, as the brain, lungs, liver, kidneys, spleen, &c. The amount of structure involved and the degree in which it is affected are of course greatly dependent on the size of the obstructed vessel, and on the completeness with which the part to which it is distributed is deprived of blood. Should the artery be a minor one, the portion of organ or tissue will be correspondingly small. Accordingly, minute hæmorrhagic, or fibrinous infarcta, or capillary embolias, as they are variously named, have been described by pathologists, more especially Virchow, Panum, Lancereaux, and others. Two great causes of occlusion exist. 1st. The vessel may have been rendered impervious by the impaction of a plug which has come from some other part of the vascular system, and become fixed at a particular point of its channel, though its walls at the seat of occlusion are perfectly sound; or, 2nd. arterial degeneration may exist in either of its two leading forms, the atheromatous, or calcareous; and, owing to the degree of its advancement, there may be ulceration of the lining membrane, or cicatrices, or perhaps a calcareous plate has become partially dislodged, and presents its free edge against the current of blood. It is evident that in such conditions deposition of fibrin upon the foreign body, as the affected point may be justly regarded, will readily take place, which, as it increases, will gradually block up the channel and obstruct the circulation. Embolism, as the first of these causes of obstruction is called, did not till of late years receive that attention to which it was entitled as a source of disease—sudden in its advent, and often most serious in its consequences. In surgical practice it by no means rarely has produced mortification and death of an extremity, necessitating its removal by amputation. Very generally in such cases the embolus comes from the imperfect valves of the left side of the heart, more especially the aortic; and, in the opinion of most pathologists, consists of fibrin which was originally deposited there, but has been set free by the force of the out-going blood-current, and, after travelling along the larger trunks, has become impacted in one whose calibre will not permit its further progress. About five years since, in my own practice, in midsummer, I had occasion to remove the leg of a young woman, about twenty years of age, a little below the knee, on account of dry gangrene from the cause referred

to. She died; and, at the *post-mortem* examination, the heart presented the appearance due to acute pericarditis and endocarditis. The aortic valves were loaded with fibrinous vegetations, some of which had doubtless been forced away by the impetus of the blood, and had ultimately blocked up the arteries of the leg.

In pregnancy and the puerperal state there is a tendency to hyperinosis or excess of fibrin in the blood, and a consequent proclivity to its coagulation within the vessels. Fortunately, however, the clots are usually formed in the venous trunks, and particularly those of the lower extremities, as occurs in *phlegmasia dolens*. They are generally also thrombotic in their nature; although sometimes it would seem that coagula so formed become separated, are carried to the right side of the heart, and, after leaving it,—probably having meanwhile increased in size,—are ultimately impacted in the pulmonary artery, producing most sudden and alarming symptoms.

Thrombosis has also received a vast deal of attention during the past few years. The first notice that I have been able to find of it is by the late Professor John Thomson, of Edinburgh, in Mr. Hodgson's work on *Diseases of the Arteries*, published in 1815. Dr. Thomson records very fully a case of extensive disease of the arteries, in which the leading trunks in the arm and leg were obliterated by plugs of lymph; and, owing to the deprivation of the blood-supply, the leg became gangrenous. It is somewhat surprising that the record of this very interesting case should not have directed general attention to the subject, and that not till Virchow and other pathologists had prominently noticed it was its importance fully realized.

As I have said, there are two leading forms of arterial degeneration, the atheromatous, and the calcareous, or ossification, as it is sometimes, though erroneously, called. Very generally in advanced life the aortic system of vessels presents indications of having undergone one or other of these changes. Calcification is for the most part confined to the old; atheroma is not infrequently met with in comparatively young persons. With regard to extent, neither form is, as a rule, limited to one or two vessels, but usually affects a large number. There are, however, very great differences, some arteries being much more involved than others. By and by I shall advert to this point in regard to one of its practical bearings. Owing to either or both of these forms of degeneration, the arterial wall is often rough and irregular, favouring the deposition of fibrin and the formation of plugs.

With these introductory observations, I will now proceed to describe the case which I wish to submit to the Society.

Duncan McKenzie, aged 74, iron moulder. From the statements of his friends, it was ascertained that he had left his residence on the morning of the 26th of last March, about eleven o'clock, apparently in his ordinary health, which upon the whole was pretty good. He had not, however, walked many yards when he fell suddenly to the ground in a state of unconsciousness. On being raised, it was found that he was unable to stand, and that this was caused by loss of power of the left side of the body. Shortly afterwards he was carried into the Town's Hospital. At half-past three p. m., four and a-half hours after the occurrence, I found his condition to be as follows:—He lay in bed apparently unconscious; but, on asking his name, occupation, and putting other simple questions to him in a loud tone of voice, he answered in a confused manner, but yet quite correctly; and it was evident that he was at no loss for words, though his articulation was somewhat indistinct. The palsy of the left upper extremity was complete. The arm lay motionless by the side, the muscles being soft and relaxed, and he was quite unable to move it; nor was there the least involuntary movement on tickling or pinching the skin. He appeared to have a little power over the left lower extremity, although it was somewhat difficult to decide whether the slight attempts at withdrawal of the limb on irritation of the surface were to be ascribed more to voluntary action on sensation than to reflex contraction of the muscles. Sensibility on the affected side was greatly impaired, if not totally in abeyance. Thus, there was no indication of sensation on pinching or pricking with a needle the integument on the left side, either of face,

arm, or side of body. However, as has just been said, there appeared to be imperfect sensibility of the affected leg. When the same tests were applied to any point on the right side, he quickly and clearly voluntarily withdrew the part, and more than once said, "Don't nip me." Pupils were nearly equally dilated, but not greatly so; they contracted, though somewhat sluggishly, under light. On opening the left eye and tickling the margin of the upper eyelid, there was no result; but on applying the same stimulus to the right eyelid, the eye was forcibly closed by instant and vigorous contraction of the orbicular muscular fibres, and he afterwards rubbed and pulled the eyelid with the right hand, as if to remove the irritating cause. He protruded the tongue when desired, but the point was directed towards the palsied side; the left angle of the mouth drooped, and the face was slightly drawn to the sound side. He swallowed with much difficulty. Respiration was unaffected, and there was no inequality in the movement of the two sides of the chest. The temperature was taken in the axilla with due precautions to insure accuracy. On the palsied side it was 98½; the sound one was a degree higher. The irritability of the muscles was tested by galvanism. A weak interrupted current was passed down both arms, producing contractions, which, so far as could be observed, were equal both in strength and rapidity in their respective muscles. Cardiac dulness slightly increased; sounds normal, except that the first was less clear than usual. Branches of temporal artery were prominent, and were also unusually firm under the finger. Pulse 76, regular, and of medium strength. Had incontinence of urine.

Observations of his case were recorded at intervals, until his death, which occurred at two a. m. on the morning of the 29th, being sixty-three hours after the seizure—but these need not now be stated, as the symptoms did not change materially in character, except that somnolency increased greatly during the last twenty-four hours of his life, and he died comatose.

The body was inspected on the third day after death. In making the examination, I had the valuable aid of my assistant, Dr. Barbour. The following were the morbid conditions:—1st, *Head*. Dura mater somewhat thickened, and adherent to the skull so firmly that a portion remained connected with the bone at the vertex, in removing the calvaria. Meningeal vessels contained a medium quantity of blood. All the arteries at the base of the brain were the seat of marked degeneration, principally, though not exclusively, of an atheromatous kind. The channel of some of the vessels was much encroached on by the morbid thickening. The entire cranial portion of the internal carotid artery was occluded by firmly coagulated blood, forming a complete mould of its interior. Similar obstructions also existed at the commencement of each of its principal divisions, the middle cerebral being more especially involved. On following the main trunk downwards in the neck, the plug was found to extend unbroken almost to the bifurcation of the common carotid artery. The early part of the vessel was highly atheromatous, and was distinctly dilated for about an inch. Here also a portion of the clot was found between its coats, the blood having apparently forced its way through a rent in the internal one. The cast of blood was of a deep red colour and of considerable consistence throughout its entire extent; but it was firmer at its commencement in the neck than in the base of the skull. The whole of the right hemisphere of the brain, except the back part of the posterior lobe, and the convolutions of the upper surface, was distinctly softened. The degree of softening varied at different parts, being greatest in the middle lobe, below the level of the *corpus striatum* and *thalamus opticus*. The former of these centres was deeply involved; the latter was less affected. The softened parts were of a bright, pearly-white colour, and had a worm-eaten appearance. They presented no vascular points. The central part of the middle lobe, where the degenerative process was most advanced, was of the consistence of pap, but nowhere was the brain substance diffluent. The other hemisphere was normal in consistence, but the medullary substance had a yellowish tinge; consequently the contrast in the aspect of the two hemispheres was very

striking. The specific gravity of the white substance just external to the *corpus striatum* was 1033 on the right side, and 1048 on the left.

Chest.—The heart weighed 13½ oz. The left ventricle was dilated and its wall thin; the mitral and aortic valves were thickened at the base, and the curtains of the latter were less transparent than usual; but they all appeared competent for their functions, and the changes described were not greater than are usually met with in advanced life. The aorta was also the seat of morbid change, which was most marked in its abdominal part, especially about the bifurcation into the iliac trunks. Near the heart, the wall of the vessel was soft, though presenting numerous atheromatous spots; but in the abdomen it was brittle, and at various points calcareous plates existed, covered by thin lining membrane. The cortical substance of the kidney had undergone fatty degeneration, but only to a limited extent.

Before entering on the diagnosis of this case, I will shortly direct attention to several of the leading symptoms, and *post-mortem* conditions.

1st. With respect to the sensibility of the palsied parts, considerable misconception has lately been shown by good observers in their statements regarding the degree in which it is affected in hemiplegia. In the remarks on a case of hemorrhage into the *corpus striatum* and *thalamus opticus*, accompanied by apoplectic symptoms, which I recorded in the Medical Times of the 15th of last March, I adverted to this point, and stated that the alleged escape of the sensory function did not consist with my experience in cerebral hemiplegia. That case was one of hemorrhage; the one which I now record is the effect of the other great cause of the apoplectic condition, softening: so that these cases confirm the old belief, that both sensation and motion are implicated, the latter certainly more uniformly than the former. They also indicate that the impairment or loss of these functions is dependent on the gravity of the structural change rather than on the nature of its cause. The mistake referred to probably arose from the fact that the sensibility of the palsied parts usually returns more quickly than the motor power; though I am satisfied from my own observations that in many cases of long standing, if careful examination be made by the compasses, according to Weber's method, it will be found to be only imperfectly restored. Exceptional cases, nevertheless, do occur, in which it escapes almost entirely, even when the motor function suffers severely, and others are met with more frequently where it is not greatly impaired. To what are we to ascribe this comparative immunity of the sensory function and also its more rapid restoration? The explanation is probably to be found in the observation of Brown-Séquard, that sensory impressions continue to be transmitted by the central gray matter of the spinal cord, even though it be entirely cut through with the exception only of a narrow bridge; and, as Dr. Broadbent suggests in a valuable paper in the last number of the Medico-Chirurgical Review, we may fairly suppose that this apparently diffused transmission in the cord prevails in the higher part of the sensory tract, and is shared by the *thalamus opticus*, which is believed by many to be the principal seat of sensation. On this view, the property of transmitting impressions, unlike the motor function, is independent of the integrity of particular fibres, so that even though a large portion of the last named centre is destroyed, impressions which may arrive at it will be readily transferred to the part which remains sound; and therefore sensation will be rapidly restored.

In the description of the symptoms it was also noticed that there was loss, or, at least, great impairment of sensibility on the left side of the face. The degree in which several of the cranial nerves are involved in hemiplegia does not appear to have been at all carefully observed. Dr. Sanders, of Edinburgh, in a valuable paper in the Lancet, of October of last year, did good service in pointing out that the late Dr. Todd had fallen into error in ascribing the paralysis of certain muscles of the face in ordinary hemiplegia to functional lesion of the fifth pair instead of the facial motor; but, strangely enough, he himself has committed a mistake of a very similar nature, in doubting that in this form of palsy the fifth nerve is ever involved. His words are, "I have hitherto failed to observe any clinical evidence that the fifth pair is

at all implicated in ordinary cases of facial hemiplegia," and he adds in a foot-note, "Romberg, however, describes motor and sensory paralysis of the fifth pair as present in recent cerebral hemorrhages. I know no evidence of this." During the last year I carefully noted the symptoms in forty cases of hemiplegia, due to organic changes in the brain, mostly of a hemorrhagic kind; and many of the patients are still resident in the Town's Hospital. In these cases the duration of the paralysis ranged from a few days to many years. On referring to my note book, I find that at the time of the examination sensibility was defective on the affected side of the face in no less than fourteen instances; two were hyper-sensitive, one had been overlooked, and in the remaining twenty-three its condition was normal, although not improbably, from the fact to which I have already referred, viz., the frequent rapid restoration of the sensory function, an impairment may have existed in some instances when the palsy occurred.

In connection with the motor function, it was remarked that there was no irregularity in the movement of the chest; the intercostal muscles of the palsied side contracted as regularly and as vigorously as those of the sound one. This is usual in hemiplegia. The immunity of these muscles, and those also of the abdominal wall, besides a few others, seems somewhat anomalous, seeing that the muscles of the upper and lower extremities suffer so severely. Hitherto the only explanation given has been to the effect that the contractions of the muscles, which were little, if at all, affected in hemiplegia, were of a *reflex* character, and that, therefore, organic changes in the *voluntary* centres of motion and sensation did not affect them. This was satisfactory so far as the simply reflex movements were concerned, but it did not explain the continuance of contractions clearly in obedience to the will. Dr. Broadbent, in the paper to which I have already alluded, has suggested a very probable hypothesis in explanation of the difficulty. It is, that the nerve nuclei of those muscles on opposite sides of the body, which usually act in concert, or, as he has said, "whose action is bilateral, are so connected by commissural fibres as to be *pro tanto* a single nucleus." This combined nucleus, he considers, has a set of fibres from each *corpus striatum* —(which many physiologists concur with Dr. Carpenter in regarding as the great centre for originating voluntary motion)—and "is usually called into action by both of these centres, but will be capable of being excited by either singly, more or less completely, according as the commissural connection is more or less perfect." This transverse commissural connection has been observed in the case of the third nerves, and is therefore more than a mere hypothesis; but further observation is required to establish its general existence.

No difference was observable in the contractions of the muscles of the two arms on the transmission of a galvanic current. Opinions very much opposed to each other have been advanced by leading authorities in regard to the degree in which the irritability of the palsied muscles is affected. Dr. Marshall Hall considered that they always responded more readily to galvanism than the sound ones; but Dr. Todd showed that in many instances of paralysis from a cerebral cause the electric irritability is not increased. The view which at present receives the support of Duchenne, Meyer, and other high authorities on this subject is that, if the disease is in the spinal cord or nerves, the muscular irritability is decidedly diminished; but if in the brain, that that function is not usually impaired. Lately, Dr. Russell Reynolds has stated that his experience is opposed to the last conclusion, and says that in a very large majority of cases of cerebral hemiplegia he has found the irritability to be notably less in the paralysed limbs. My own impression, formed from the examination of the forty cases of hemiplegia above referred to and others, is, that, as a rule, irritability is dependent on, and proportionate to, the integrity of the muscular fibre. In cases of some standing it is well known, that from want of use and defective innervation, with its results, the muscles gradually degenerate. The sarcous elements become fatty, and are eventually removed, leaving little more than the sheath substance. Where degeneration exists, muscular irritability, as might be expected, is impaired; but in recent cases, where no deterioration of the

tissue has as yet taken place, I have been unable to observe any difference either in the strength or the rapidity of the contractions of the muscles of the two arms.

I referred particularly to the prominence and thickening of the walls of the temporal arteries. The importance of examining these vessels, in addition to the radial trunks, has not been sufficiently insisted on. My observations have led me to place considerable value on a knowledge of their condition as a guide both to diagnosis and treatment. Arterial degeneration is, as we have seen, not confined to one vessel, but is generally widespread throughout the body. More especially, if we find one set of branches of a common trunk the seat of either form of degeneration, we may infer, with every probability of correctness, that other branches of the same trunk have undergone a similar change. Thus, should the temporal artery be unusually firm and prominent, and perhaps present irregular thickening of its walls on passing the finger along its course, we have evidence of morbid transformation in its coats. And it may further be inferred, as it and, say, the middle cerebral are branches of the one parent trunk—the common carotid, from which they are *mediately* derived—that this cerebral and other internal divisions are also in an unhealthy condition. I have examined after death several cases in which the radial and temporal arteries were hard and deficient in elasticity, and in every instance the branches of the basilar and internal carotid at the base of the brain were more or less diseased. It will be found, however, that generally the radial presents indications of degeneration sooner than the temporal, so that, in a given case, should the latter be affected, we may conclude with the greater certainty that the cerebral arteries are decidedly involved. It, however, by no means follows, though we may not observe any morbid alteration in these two vessels, that the arteries internal to the skull are consequently quite sound. Two instances in proof of the contrary were lately under my care. One of these was examined along with Dr. Barbour. In it the walls of the anterior temporal and radial arteries were found to be healthy, nor was there the least appearance of thickening of the latter at the point where the *superficialis volæ* arose abnormally as a considerable trunk, about two inches above the wrist, though atheromatous thickening is more apt to be found about a bifurcation than anywhere else. But on examining the basilar and branches of the internal carotid in the base of the skull, a number of yellow spots of that so-called deposit were found at various points in their coats.

In connection with the *post-mortem* appearances, it may naturally be asked why, when only one carotid artery was occluded, did such extreme softening occur, seeing that there have been numerous instances of ligature of that vessel, and even of both trunks, with due interval between the operations, without any material disturbance in the functions of the brain; though some have certainly terminated fatally through softening of the cerebral substance. The reply to this question is, 1st, that, in the case which I have submitted to the Society, the arteries beyond the circle of Willis were plugged, so that the circulation could not be maintained in them through the branches communicating with the basilar behind, or the anterior cerebral of the opposite side in front: and, 2nd, all the other arteries of the brain were in a highly diseased state, and, consequently, could not accommodate themselves to an increased pressure of blood on their walls, so as to establish a collateral circulation. There was not the least evidence of even an attempt at the opening up of collateral channels. This is rather unusual, as, in a large proportion of cases of brain softening, indications of a compensating supply of blood are noticeable in the softening only of the central part of the area dependent on the occluded vessels, and also in the injection of the brain substance round the softened part. On the other hand, where the carotid has been ligatured successfully, no serious disease of the arteries has existed, and, in all probability, there has been no obstruction to the circulation through the circle of Willis.

It was further stated that the internal carotid trunk was dilated for about an inch at its commencement. A writer in the Medical Times of the 30th

of March last, states that he has noticed similar dilatation at the same points in numerous instances of atheromatous disease of the arteries. I have not yet had leisure to satisfy myself by examination of the general correctness of this observation; though it is so far corroborated by the case under consideration.

With respect to the nature of the softening, there can scarcely be a doubt that it was atrophic and not inflammatory. Not the least indication of increased vascularity existed; on the contrary, there was clear evidence of deprivation of blood in the obstruction to the circulation, and in the glistening-white aspect of the softened parts. Dr. Bennett, of Edinburgh, has certainly shown that, in many cases of white softening, corpuscles are observed similar to those met with in inflammatory exudations; but Virchow, who calls them granule-globules, maintains that they may be formed quite independently of inflammatory action, simply as a result of fatty degeneration. I regret that in my case no microscopical examination was made. However, the whole circumstances rendered it highly improbable that such action had existed.

The last point to which I wish to refer is the specific gravity of the brain substance. Its condition was very remarkable. So far as I can find, the greatest difference hitherto recorded in brain softening between corresponding parts of the two hemispheres is six degrees. Two cases are reported in which this difference existed—the one by Professor Aitken, of Netley Hospital, the other by Dr. Bucknill, now Chancery Visitor in Lunacy. In my case the softened part was no fewer than fifteen degrees less dense than the corresponding part of the opposite hemisphere.

We will now proceed to consider shortly some points in the diagnosis. In conversation with Dr. Barbour, previous to the autopsy, I remarked that the symptoms closely resembled those in the case of sanguineous apoplexy which I had just reported in the Medical Times and Gazette, and that, as in it we might probably find a hemorrhage limited very much to the *corpus striatum* and *thalamus opticus*. At the same time I added, that the pathological condition might be softening of the brain substance, as all the symptoms could as readily be accounted for, supposing it alone were present. Ought the diagnosis to have been more decided? was there any symptom which pointed clearly to softening rather than to cerebral hemorrhage? or ought the consideration of the case as a whole to have led us to that conclusion? There was no history of premonitory symptoms. Authorities are divided in their opinions regarding their greater frequency in softening than cerebral hemorrhage. In my own experience, I have not observed much difference in this respect, yet there has generally been noticeable a dissimilarity in the *nature* of the prodomata. In softening, some impairment of mind is often a prominent feature prior to the paralytic seizure; on the other hand, giddiness I have found to be the most frequent precursor of sanguineous apoplexy, while, as a rule, there has generally been little or no apparent defect in the mental powers.

The degree in which consciousness is affected is justly held to have an important bearing on the differential diagnosis. Dr. Todd insisted on its importance in this point of view; and Trousseau in his clinical lectures has also directed attention to its value as a symptom. They and other authorities are agreed, that when hemiplegia is *complete* and occurs suddenly, without loss of consciousness, softening of the brain may be diagnosed. There can be no doubt of the correctness of this observation. But my experience does not enable me to agree with Trousseau's conclusions concerning cases in which consciousness is partially affected along with complete hemiplegia. I quote his remarks on this point from the translation by Dr. Bazire, —"When the intellect is affected to some extent but not entirely—when there is obtuseness but not complete loss of sensibility—whilst there is absolute loss of motor power, as in the case of our patient in St. Agnes Ward, we must always, according to Récamier, diagnose hemorrhage in connection with softening, or which has been termed capillary hemorrhage. I am too much a pupil of Récamier, I confess, not to adopt his conclusions, which my

personal experience seems to me, besides, to have corroborated in the case I have just alluded to." These are his words. In the case which I have brought before the Society, these very symptoms existed. The intellect was considerably affected but not entirely; there was also a slight indication of sensibility; there was absolute loss of motor power of both extremities on the one side (for the slight contraction of the muscles of the leg on pinching the integument can scarcely modify this remark); and the palsy occurred suddenly; yet, as I have said, there was not the least appearance of effusion of blood into the brain; on the contrary, the very opposite condition existed. On contrasting the symptoms with those existing in the case of sanguineous apoplexy, to which I have already referred, a very striking parallel will be noticed between them. Indeed, in all essential respects they were alike, so that, I think, I am warranted in submitting, in opposition to Trousseau's view, that general softening of a hemisphere, and a limited sanguineous effusion into the *thalamus opticus* and *corpus striatum* of one side may produce symptoms so similar as to render it impossible to distinguish between the two conditions.

The subject of treatment is so wide a one, that I shall content myself with making only a very few observations regarding it.

In my patient's case, after having cleared out the bowels with croton oil, I did little more than direct that milk and other fluid nutriment should be administered at short intervals. The idea of venesection or bleeding in any form was not entertained. The profession in this country is now very generally agreed on the impropriety of employing depletive measures in the majority of cases of apoplexy accompanied by palsy. It would, however, I think, be a mistake to refrain from bleeding in all cases. Without following any arbitrary rule, it is right to consider the peculiarities of each case, and thus ascertain the indications for treatment. It is of great importance to attend to the state of the heart and arteries, and I think, more especially the temporal trunks. Should the latter or the radial at the wrist be rigid, we may infer that the vessels inside the cranium are not sound, and that the supply of blood is at least not over plentiful; but should there be no valvular disease of the heart, should the left ventricle be healthy or hypertrophied without valvular affection, should there be no rigidity of the arteries, and the force of the circulation be good—in these circumstances abstraction of blood will probably be beneficial.

In the case of sanguineous apoplexy which I have spoken of, the temples were leeched; but afterwards I regretted, particularly in the light of the *post-mortem* examination, that I had not withdrawn blood from the arm. But I must not pursue this question further than simply to refer to Dr. Todd's work on the nervous system, in which indications for venesection and the treatment generally are clearly laid down. Dr. Chambers and others concur in the principles which he advocated. Trousseau has also an admirable clinical lecture on the subject. It is, however, I think, to be regretted, that he should have recommended venesection as a mere matter of expediency. Thus, after deprecating the employment of antiphlogistic measures in all cases of cerebral hemorrhage and apoplexy generally, as being not only useless but injurious, he adds (and I now use his own words) "to save your responsibility, avoiding at the same time what your conscience forbids, open a vein, but in such a way as only to draw an insignificant quantity of blood, and explain to the friends that it would be dangerous to go further." Making every allowance for the deep-rooted prejudices in favour of bleeding existing in France, in the minds of the general public and also of a large portion of the medical profession, I cannot help thinking that the counsel here given, and by a teacher of so great eminence, is much too accommodating in its character. Better far to exercise a little moral courage; frankly state our convictions to the friends of the sufferers, and even though, in an instance or two, unjust reflections be thrown on our treatment, before long, action consistent with the principles we hold is certain to gain general approbation, and, what is of still greater importance, will ensure the full approval of our minds.—*Glasgow Medical Journal, Aug.*, 1866, *p.* 132.

102.—IODIZED COTTON.

By Dr. Robert Greenhalgh, Grosvenor-street, London.

[Iodized cotton is made as follows:—]

Two ounces of iodide of potassium and one ounce of iodine are dissolved in eight ounces of glycerine, in which solution eight ounces of cotton wool are thoroughly saturated and then carefully dried. The best method of applying it is to take a portion of the iodized cotton about the size of a half-crown piece secured by some silk thread tied crosswise, and, passing it through a speculum, to press it firmly against the cervix uteri, over which a piece of cotton wool similarly secured, somewhat larger, and freely saturated in glycerine, should be placed and retained *in situ* while the speculum is being withdrawn. It may be applied twice or three times a week, and be kept in the upper part of the vagina from twenty-four to forty-eight hours.

The cases in which I have found the application most useful are, subinvolution with or without congestion or induration of tissue; in cases of chronic inflammatory enlargements and thickenings of the cervix uteri; in one case of pruritus, apparently due to acid secretion passing through the os uteri; in two cases of fibroid disease of the anterior lip of the uterus; in chronic pelvic cellulitis; in hæmatocele; and in one case of epithelial cancer of the neck of the uterus.

It possesses the following advantages:—It is clean, light, and portable; it produces no irritation; destroys all fœtor; is considerably stronger than the compound tincture of iodine, is more readily absorbed, and can be kept in contact with the diseased tissues for a longer period. Moreover, it does not soil the linen like the medicated pessaries and suppositories and many other topical applications in general use for uterine affections.

It was only the other day a clergyman's wife informed me that she preferred this local remedy to all others, because the laundress of the village, of which her husband is rector, does not know by her linen that she has any internal disease, which was always the case with former applications to that part. Several of my patients, wholly unconscious of the nature of the remedy, have complained of a taste of sea-weed from four to eight hours after its introduction. If the iodized cotton be withdrawn from the vagina in thirty hours, it is nearly white, showing beyond all doubt that it has parted with the greater part, if not all, its iodine. On analysis, a portion of the iodized cotton which had been retained forty-eight hours in the vagina was found to contain only a slight trace of iodine. I should state that by the aid of the silk thread attached the patient can remove it herself at any time.

I am confident that if your readers engaged in the treatment of female affections will give it a fair trial in suitable cases, they will not be disappointed with its effects.—*Lancet, May* 26, 1866, *p.* 582.

103.—ON THE PRINCIPLES FOR THE SUCCESSFUL TREATMENT OF CANCER BY INJECTION OF ACETIC ACID.

By Dr. W. H. Broadbent, Assistant Physician to St. Mary's Hospital.

[In an article published in the Medical Times and Gazette, priority is claimed for Sir James Simpson in the employment of various substances by way of injection, with a view to induce absorption or atrophy of malignant or other tumours. It appears that this is the case, although Dr. Broadbent was not aware of it until a few days before he read his paper before the British Medical Association. The priority which Dr. Broadbent desires to claim is that of having laid down the principles on which a successful treatment of cancer may be founded.]

It may be taken as demonstrated by the cancerous gland exhibited by Mr. Moore at the Pathological Society, that acetic acid injected into a malignant tumour may produce on the cancer structure *in situ* effects similar to those witnessed in cancer and other cells on the microscopic slide.

The case published by Mr. Moore in the Medical Times and Gazette of October 27 may further be taken as demonstrating at least the possibility of absorption of the tumour thus disintegrated—a result of which a single case of my own had merely raised a strong presumption, but of which I now have promise in more than one additional instance. It is satisfactory to have reached this point, and we may hope for repetition of these results with greater confidence, inasmuch as the conditions of their production approach those of an experiment in the laboratory; the acid is carried directly to the malignant textures, and has on them a certain chemical action from which the further consequences flow.

The points to be ascertained now are how this result may be obtained in the greatest number of cases, by what method it is to be sought in the various phases and stages of cancer, and what will be the ultimate effect. It was not my wish or intention again to write on this subject, except as a contributor of facts, until I had from experience some definite suggestions to offer as to the mode of procedure, and some definite evidence as to the value of the treatment. I think I have, however, reasons for departing from this resolution, since I hear of cases in which the course pursued is not such as I should suppose best adapted to secure the desired end, and anticipations are entertained which are inconsistent with the mode of action of the acid. In the absence of experience, which will require much time, the best guide will be a thorough apprehension of the principles on which we are acting; and a full discussion of these, which would have been premature until corroborated by experiment, may now be of service. Their application to various cases will be comparatively easy.

The chief points which constitute the adaptation of acetic acid for employment by injection against cancer are already sufficiently understood—its action on cells, and its non-coagulation of albumen. These relate mostly to its solvent effects on the tumour itself; the grounds on which absorption of the disintegrated products may be hoped for have not been so fully shown.

These will probably be best exemplified by a comparison between the action of acetic acid and that of caustics. These last owe their destructive effects on the tissues of the body to powerful chemical affinity with their constituents, with which, however, they do not combine as such, but which they change chemically, oxidising, dehydrating, or otherwise decomposing them. It is no longer albumen or gelatin which exists, but some derivative. This alone probably would prevent absorption, but the coagulation of albumen, which in most caustics is associated with the chemical change, seems to be an absolute bar to this process.

Again, affecting the constituents of the tissues chemically, they are indiscriminating in their effects, and though undoubtedly a malignant tumour yields more readily and perishes first, the surrounding parts are so far damaged that suppuration is provoked.

The basis of the action of acetic acid is, of course, chemical affinity, but this is not so powerful as to decompose the tissues, if indeed the tendency is in this direction at all. A piece of white fibrous tissue treated with dilute acetic acid swells up, becomes gelatinous, and loses entirely its fibrillated appearance; but by careful neutralisation it may be restored to nearly its original character and tenacity. Accordingly, when a little acid escapes into the connective tissue, there is smarting at the moment, and probably some inflammation afterwards. We may suppose that the white fibrous tissue has been partially gelatinised, but it is quickly restored by the alkaline blood to its normal condition. Cells thus treated are more seriously affected, the visible evidence of this being the clearing of the cell wall and contents, the change in the nucleus, and ultimately solution. This would seem to indicate a disturbance of those conditions on which the vital activity of the cell depends, and ceasing to grow and multiply, and failing to undergo development, they must undergo disintegration, even if not directly dissolved by the acid. The products of this process are so little different from ordinary plasma, and surrounding parts are so little affected, that absorption takes place.

The conclusions to be drawn from these considerations are, first, not to

attempt too much at once. If a tumour of large size could be broken down by a large amount of acid introduced at one or many points, the amount of *débris* might be too large for absorption, and so much acid might pass into surrounding tissues as to excite inflammation, going on to suppuration.

Next, which is even more important, not to repeat the injections too soon. Absorption of such matters as result from the disintegration of a tumour is a slow process. On this point, too, we have the light of experience. In Mr. Moore's case the injection was made on September 5, and it is only on October 1 that the cancerous nodules are found to have disappeared. In the case of secondary cancer of axillary glands recorded in my pamphlet, the injection was made on June 26, and never repeated, and the improvement has been slow but continuous ever since. The disease is not rapid, and we have ample time given us to oppose its advances. The rule to be laid down is at any rate to do no harm—least of all by precipitancy.

When the skin is involved, or when the tumour is of large size and rapid growth, my experience does not lead me to expect absorption. We may, however, cause it to be destroyed and discharged. It may or may not be found desirable to resort to this process largely, but there are certain special cases in which it seems to be the only treatment available. With destruction as the object, the indications become entirely different. The injection should be most thorough, and the acid strong, so that the entire disease may be removed at once. When the skin is broken, our best opportunity is gone; the acid escapes, and, not remaining in contact with the morbid structure sufficiently long, fails of its due effect.

Another question to which it seems to me necessary to refer in connexion with this treatment is the liability to recurrence. As the action of acetic acid is in no way specific, no specific results are to be expected—that is, no such results as are not clearly explicable and referable to the mode of operation of the remedy.

It is possible, perhaps probable, that there will be less liability to local return of the disease after removal of a tumour by acetic acid than by the knife, as the acid, being more or less diffused in the surrounding tissues, may reach germs which would have escaped the knife; and there is the more reason to hope that such will be the case from the excellent results which have followed the application of a solution of chloride of zinc after cutting operations as recommended by Mr. De Morgan. If, however, there are germs implanted in the vicinity of a tumour to which the acid does not penetrate, or if the local conditions which led to the development of the first manifestation of the disease still exist and are not modified by the action of the acid, a new tumour will appear. Local recurrence, therefore, must be expected in a certain proportion of cases, especially when of old standing; but as it will probably be detected early and at once dealt with, no fear need be entertained. So again, if germs have been already disseminated, the removal of the original tumour will not prevent their development, but there is no danger that germs will be dislodged during the treatment, and set free to work mischief elsewhere.

We touch here upon a point where great divergence of views as to the ultimate results of treatment will exist, according as the doctrine of the constitutional or local origin of cancer is held. I personally look upon cancer as primarily a local error of nutrition, in which not the blood, but the part is at fault. It may be said to be constitutional, just as almost every disease is, in a sense, constitutional; that is, there is a reason why, under similar circumstances, one person has it and another has not: but I do not believe in any condition to which the term "diathesis" is applicable, except such as is created by the existence of a tumour as a centre of dissemination. Facts, however, and not opinions, are what are required at the present moment; the value of the treatment must be determined by experiment, not by discussion, and I have, therefore, refrained hitherto from even a reference to this subject, and now forbear to enter upon it. But whatever opinions may be entertained on the point of doctrine, the practical conclusion at which surgeons seem to have arrived is, that a cancerous tumour is more dangerous

as a centre of dissemination and as threatening suffering and death than useful as an organ of elimination, or as protecting other parts by concentration of the morbid tendency in itself, and that consequently its removal is, as a rule, desirable. A more safe and easy method of effecting this than the usual operation, without increased liability to recurrence, it is hoped is found in the injection of acetic acid. This alone would be no small gain, even if the disease is to be considered as constitutional. Cases would come under observation earlier, there would be no hesitation in interfering, as now very frequently happens, and the disease would not be allowed to gain head. But it has already, also, been found of great use in cases which either from their situation or character were considered absolutely irremediable. The treatment is as yet in its infancy, and new developments of it will no doubt be made. It is probable that just as some of the salts of nitric, hydrochloric, or sulphuric acid are found useful as caustics, the destructive properties of the acid being limited, and the action modified by the base, so the acetates may find a place in the treatment of cancer—the peracetate of iron, for example. So, again, the chemical homologues of acetic acid may be found to have advantages over acetic acid itself. But at present the work lying immediately in our path is to ascertain what acetic acid will and will not do, and how to turn its effects on malignant structures to the best account. Failures are, of course, to be looked for; it is not to be expected that cancer, from being the one incurable disease, is to become by any treatment the one always curable.

As to the extension of this method of treatment, or modifications of it, to simple tumours, which naturally suggests itself. I do not think it promises well theoretically, and one has not the same strong inducement to try it.

There is one important class of cases, however, to which I should greatly wish to see some similar treatment applied—ovarian cysts. It is scarcely probable that I should, within any reasonable time, have the opportunity of making the experiment under the circumstances which a due regard to the safety of the patient would demand, or I should not content myself with suggestion. It may be thought that a dominant idea has overpowered my common sense, but it seems to me that the same considerations apply as in the case of cancer. The filling of an ovarian cyst is not the result of mere osmosis, but must be due to the activity of cells on its inner surface, while the extension and strengthening of the walls follows, on the principle crudely expressed in the old physiological maxim, "*ubi stimulus ibi fluxus.*" To modify the structure and nutrition of these cells would, if it could be thoroughly effected, put an end to the growth of the cyst. This has been attempted by the injection of iodine, which, though not successful, has shown us that even strongly irritant fluids may be injected with impunity. I should not, as has been done in the case of iodine, empty the sac, but withdraw only a small amount of the contents—little more than would be replaced by the fluid to be injected, which would be, in the first instance, a small quantity of dilute acetic acid. No apparent effects, good or bad, following, I should repeat the injection in a week or ten days, testing the fluid withdrawn. When the contents of the cyst had become decidedly acid, I think it probable that the structure and vitality of the cells lining it would be affected and their growth arrested—a result which I should expect to be followed by resorption of the fluid and shrinking of the walls.—*Medical Times and Gazette, Nov.* 10, 1866, *p.* 512.

104.—ON THE ACTION OF ACETIC ACID ON OVARIAN CYSTS.

By Dr. F. E. Junker, London.

[In the preceding paper, Dr. Broadbent, speaking of ovarian disease, says:—"It seems to me that the same conditions apply as in the case of cancer." Dr. Junker denies this, and observes that the osmotic properties of the cyst must never be lost sight of. The chemical action of the acid will not remain

confined to the secreting cells; such will also affect the stroma and the peritoneal coat of the cyst, and the surrounding parts. To determine these points, Dr. Junker has made the following experiments.]

Acting on the suggestion of Mr. Spencer Wells, who kindly furnished me with the most appropriate material for the experiment—viz., a simple ovarian cyst, with a smooth external coat, perfectly free from adhesions, fresh, having been extirpated only last Saturday (10th inst.)—I constructed a dialyser by stretching a portion of the cyst as a diaphragm over a gutta-percha hoop; and after having carefully washed the cyst, I placed it in a vessel containing distilled water. Into the dialyser the same quantity of a mixture of two parts of water and one part of concentrated acetic acid (sp. gr. 1040) was placed. Both liquids were tested with litmus paper; at first at intervals of five minutes, and afterwards of fifteen minutes. Even the first test detected acidity in the distilled water in the vessel, and an increase of acidity steadily occurred. By comparing the two series of test-papers thus obtained after six hours, a marked decrease of acidity in the liquid within the cyst was observable, and after twenty-four hours the osmosis was completed, the test-paper showing the same degree of acidity within and without the dialyser.

But it was not merely osmosis that had taken place; there was also a perfect alteration and disintegration of the portion of the cyst-wall acted upon by the acetic acid. It had been swelled to considerably more than twice its original thickness. From being formerly an opaque fibrous stroma, it had now changed into a diaphanous gelatine, and softened to such a degree, that the mere weight of a goose-quill easily perforated it.

I am fully aware of the objection which might be raised, that an experiment with a dead membrane is vastly different from what would take place with a living membrane within the body. I can only say that osmosis, which plays such an important part in the vegetable and animal economy, will be carried on more rapidly through membranes in which circulation and active innervation perform their functions. The physiology of nutrition bears this out.

Experiments on animals must teach us what would be the local effect of acetic acid on the peritoneum and the serous coats of the abdominal viscera, even if its dissolving and destroying properties already alluded to did not exist. We must not forget that the peculiar anatomical relations of the cyst with the peritoneum in the abdominal cavity create very different conditions from those of a cancer surrounded by fibrous tissues, fasciæ, aponeuroses, muscles, and fat.

The results of my experiments have been quite enough to prove that injecting acetic acid into ovarian cysts must necessarily be a very dangerous practice. Not only osmosis of acetic acid into the peritoneum takes place—and we want experiments to show how the peritoneum would bear this—but the cyst-wall would become so rotten that rupture would be inevitable.—*Medical Times and Gazette, Nov.* 17, 1866, *p.* 543.

105.—ON THE INJECTION OF ACETIC ACID INTO OVARIAN CYSTS.

By Dr. W. H. Broadbent.

The results of the experiment made by Dr. Junker, for the purpose of showing the probable consequences of injecting acetic acid into an ovarian cyst, were exactly such as I should have anticipated, the conditions being given. I intend repeating it with the substitution of a portion of recent stomach for the cyst-membrane, and hoped to have done this already, but I have not had the opportunity. I will give the details next week, but I venture in the mean time to predict that the result will be similar; and it would be equally reasonable to conclude that taking vinegar as an article of diet is attended with danger to the integrity of the coats of the stomach, and

involves the risk of dialysis into the peritoneal cavity, as that like consequences would attend the employment of dilute acetic acid by way of injection into ovarian cysts.

In the first place, the strength of the acid used in the experiment is altogether disproportionate to that of the acid which would act on the walls of the cyst if employed in the way I suggested. I did not, it is true, specify the degree of dilution, or the amount to be injected, but I think no one will fail to see that I should begin with small quantities of weak acid, which again would be diffused in the entire contents of the cyst.

Then, also, for dialysis, fluid is required on both sides of the membrane—a condition which would be met only by the presence of peritoneal fluid—an exceptional occurrence. But supposing the acid to diffuse into the peritoneal cavity, experiments of Dr. Richardson on the synthesis of disease with lactic acid furnish grounds for belief that no ill effects would follow. But Dr. Junker forgets entirely the important fact that, during life, blood is circulating in the walls of the cyst, and that dialysis takes place into it. This would prevent alike the diffusion of the acid into the peritoneal cavity and the gelatinisation of the cyst, just as it prevents the gastric juice from digesting the stomach. The risk of peritonitis from contact of acid or rupture of the sac would thus not arise. On the other hand, the acid injected into the cyst would be gradually taken up by the blood-vessels, slowly because of its admixture with so much organic matter, for which it has affinity. Dialysing through the inner layer of the cyst towards the blood, it would have on them, and only on them, an effect analogous to that described by Dr. Junker; and as these secrete (so to speak) the fluid contents, and retain more or less of the cellular character, it seems probable that the change of structure produced would modify their nutrition, and arrest their activity.

If a favourable opportunity offers, I shall certainly put this hypothesis to the test of experiment; and though I should take all precautions for the safety of the patient, I should entertain no fear of the consequences predicted by Dr. Junker.—*Medical Times and Gazette, Nov.* 24, 1866, *p.* 568.

106.—THE TREATMENT OF CANCER BY INJECTIONS OF NITRIC ACID.

By Dr. J. Hughes Bennett.

[In his work on cancerous and cancroid growths, published in 1849, Dr Hughes Bennett gives us the following passage, which shows that he was one of the first to point attention to the fact of cancer being acted upon by acetic acid and other agents.]

We have seen that certain chemical agents have a marked effect upon the cancer-cell. Acetic acid especially dissolves the cell-wall more or less, and strong potash reduces the whole to a granular mass. The continued application of these agents, therefore, would tend to dissolve the growth, if it could be brought into direct contact with the cells, and need not necessarily excite such irritation as to cause fresh exudation. The only objection is, the utter impossibility of affecting the whole mass even in cases of ulceration, and preventing the formation of deep-seated cells, while the superficial ones are destroyed. In certain cancroid growths, especially epithelial ones, the application of acetic acid is an established remedy, and should always be tried whenever it is thought possible to bring the fluid successively in contact with the entire mass of the disease.—*British Medical Journal, Nov.* 24, 1866, *p.* 593.

107.—ON THE TREATMENT OF CANCER BY THE CONTINUOUS GALVANIC CURRENT.

By Dr. Julius Althaus.

The treatment of cancer by subcutaneous disintegration, as proposed by Dr. Broadbent and others, having excited considerable interest in the profes-

sion, it may be useful to direct attention to another means of a similar character to those hitherto employed, and which, although it is not quite so easily to be had as the injecting of acetic acid, yet will, no doubt, in course of time, prove of the utmost value in the treatment of cancer and other tumours. I allude to the hitherto much neglected *chemical action of the continuous galvanic current*, apart from the calorific action of the same agent, which has long been known and used as the galvanic cautery.

Although Crusell, Ciniselli, and Tripier have at different times endeavoured to induce surgeons to make use of the chemical action of the continuous current in unmanageable cases of tumours, stricture, piles, &c., yet until now their efforts have not been crowned with success. This is, in a great measure, due to the circumstance that the batteries which have been employed were badly constructed for the purpose, and that the action of the current, when brought in contact with living tissue, was not thoroughly understood.

No such drawback now exists as regards the battery, since the modification of Daniell's arrangement, which I described in the Lancet for August 12th, 1865, is the most perfect and reliable instrument for such cases that could be devised.

The knowledge of the chemical effects of the continuous current on living tissues has also now sufficiently advanced to enable us to apply this agent with perfect safety. Those who have hitherto operated with it have mostly committed the mistake of applying either both poles or the positive pole to the part to be removed, while *only the negative pole should be used in such operations*, the circuit being closed by placing the positive pole at a distance from the diseased part. M. Tripier is the only one who has as yet been alive to the advantage to be gained by employing the negative pole alone; but even he has recommended the use of the positive pole for vascular tumours and aneurisms!

At the *positive* pole, acids are evolved, whereby the albumen is coagulated, and a clot is formed which firmly adheres to the needle used; while at the *negative* pole free alkali and hydrogen are developed, by which a slow and gradual disintegration of living tissue is brought about.

On removing the *positive* pole, hemorrhage may ensue; while the *negative* pole may be safely and easily removed without any untoward result.

The *positive* pole often produces inflammation after the operation, and the cicatrices left by it are hard and have a tendency to shrink considerably, thus leading to great disfigurement; while the parts acted upon by the *negative* pole form an eschar, which slowly separates, without pain or reaction, leaving a soft and yielding cicatrix.

The coagulating effect of the *positive* pole should therefore be entirely eschewed in all surgical proceedings; while the disintegrating effect of the *negative* pole may be safely employed wherever a needle or a sound can be introduced.

I have already had an opportunity of testing the accuracy of these principles in a case of non-cancerous tumour, which occurred some time ago in the practice of an eminent surgeon, and in which this method of operation proved entirely successful. The details of this case will shortly be placed before the profession.

I feel convinced that cancerous as well as other tumours can be removed by the continuous current, almost without pain, and without subsequent constitutional disturbance.—*Lancet, Nov.* 24, 1866, *p.* 597.

108.—HOW FAR IS THERE GROUND FOR SUPPOSING THAT THE WATER-SUPPLY IS A CAUSE OF THE SPREAD OF CHOLERA IN LONDON?

[The following article is from the report of the Lancet Sanitary Commission on the Epidemic of Cholera in the East end of London. The evidence which we have already that the spread of cholera among a population may be influenced by the nature of the drinking water is first set forth in a general way.]

"An experiment, at which mankind would have shuddered if its full meaning could have been prefigured to them, has been conducted during two epidemics of cholera on 500,000 human beings. One-half of this multitude was doomed in both epidemics (1848–49 and 1853–54) to drink the same fecalized water, and on both occasions to illustrate its fatal results; while another section, freed in the second epidemic from that influence which had so aggravated the first, was happily enabled to evince by a double contrast the comparative immunity which a cleanlier beverage could give."*

The unfortunate people who were experimented upon were the inhabitants of nine districts of London, south of the Thames—namely, of St. Saviour's, St. Olave's, and St. George's, Southwark; of Bermondsey, Newington, Lambeth, Wandsworth, Camberwell, and Rotherhithe. One part of this people were supplied by the Southwark and Vauxhall Company with water from the Thames at Battersea during both epidemics; the other part of this people, intimately distributed through the first part, were supplied by the Lambeth Company with water from the Thames at Battersea during the epidemic of 1848–49, and with water from the Thames at Thames Ditton during the epidemic of 1853–54. The following were the results of this experiment:—

First. "In the 24,854 houses supplied by the Lambeth Company, comprising a population of about 166,906 persons, there occurred 611 cholera deaths, being at the rate of 37 to every 10,000 living. In the 39,726 houses supplied by the Southwark and Vauxhall Company, comprising a population of about 268,171 persons, there occurred 3,476 deaths, being at the rate of 130 to every 10,000 living. *The population drinking dirty water accordingly appears to have suffered three and a half times as much mortality as the population drinking other water.*

Second. The tenantry of the Lambeth Company (a population of 166,906, comprised in 24,854 houses, as has been just mentioned) lost 611 persons by the epidemic of 1853–54; while by the epidemic of 1848–49, in the same houses (or rather in as many of them as then existed), it lost 1,925 persons. Not only, then, did this population suffer not a third as much as its neighbours in 1853–54, but it suffered also not a third as much as at the time of its unreformed water-supply (1848–49).

To this evidence of a positive kind, as most of our medical readers are aware, much could be added, were it necessary. But we shall now proceed to a consideration of the water-supply of the East of London.

The East of London north of the Thames is supplied with water exclusively by one company—the East London—to a line running irregularly northwards from the Thames at St. Catherine's Docks. This line, crossing the basin, and passing between the West and East Dock, makes a detour round the Mint at some distance east of it, and then proceeds westward a short distance, south of the Blackwall Railway. It turns northward again along Mansell-street, Somerset-street, across High-street, Whitechapel, and along Goulston-street. At this point it passes with slight irregularity to the south end of Norton Folgate, it then proceeds along Norton Folgate, Shoreditch, and the beginning of the Kingsland-road. Just beyond where the North London Railway crosses the Kingsland-road it leaves this road and proceeds in a straight line in a north north-west direction for about a mile and three-quarters, to where the Amherst-road and Dalston-road cross. At this point it bends in a north-westerly direction, to follow—some distance east of them—the Amherst and Rectory-roads; but we have followed it far enough for our purpose. We should have mentioned that in the course of this line along Shoreditch it leaves the main road for a time so as to include a semicircular mass of houses facing the terminus of the Great Eastern Railway.

The southern portion of this line corresponds to a certain extent with the boundary between the Central and Eastern Registration Districts. The

* Mr. Simon's Report on the last two Cholera Epidemics of London as affected by the Consumption of Impure Water. Addressed to the Rt. Hon. the President of the Board of Health.

central districts are supplied by the New River Company. In the week ending July 21st, more than six-sevenths of the deaths by cholera occurred in the eastern districts, and in that ending July 28th more than eight-ninths. In the former week, 309 out of 346 deaths by cholera happened in the registration districts of London; in the latter week 815 out of 904 in the field of the East London Water Company's mains.

If we take the boundary line we have indicated of the East London Water Company's mains, we find that in Aldgate, which lies across the south of this line, of the six deaths which occurred up to July 28th, five were on the East London Company's side of the line. North of the Aldgate sub-district is that of St. Botolph on the west side of the line, and of Goodman's-fields on the east side. In the former sub-district, which is supplied by the New River Company, and perhaps Bishopsgate and Whitechapel pumps—the last of which sources is in a terrible condition—four deaths were registered. This we shall see is the only marked instance of the spread of cholera immediately west of the boundary line. In Goodman's-fields, supplied by the East London Water Company, seventeen deaths by cholera have occurred up to July 28th. In Whitechapel Church sub-district, north of this, and, like it, east of St. Botolph's, seventy-nine cholera deaths have been recorded. North of this district lies the Whitechapel North sub-district, in which twelve deaths have occurred up to July 28th. This district extends a little west of the boundary line of the East London Company's mains, but all the deaths occurred east of the line. In Whitechapel Artillery sub-district, three cholera deaths, up to July 28th, have been recorded on the east side of the line. North of the St. Botolph sub-district and west of the East London Water Company's mains occurs the Holywell sub-district, and north of this the St. Leonard's sub-district, both in the East registration district, but west of the mains of the East London Water Company. In the Holywell sub-district two deaths by cholera, and in the St. Leonard's sub-district one, occurred up to July 28th. North of the Whitechapel Artillery sub-district comes the Bethnal-green, Hackney-road sub-district, east of the last mentioned sub-districts, and supplied by the East London Water Company. Here eleven deaths have occurred up to July 28th. North of the preceding, and running across the limits of the East London Water Company's mains, is the Haggerston West sub-district; in this one death has been recorded, occurring east of the limiting line.

These points in the distribution of the cholera deaths occurring near and on either side of the limits of the East London Water Company's supply we have made out by comparing the Registrar-General's returns with a map, on which the engineer to the company has kindly traced for us the limiting line. From a consideration of these points, it will be seen that this line indicates with very general accuracy the boundary of the cholera field in London. Further, the cholera field extends beyond the London registration districts, to West Ham, Plaistow, and Stratford; and so does this company's water-supply. However, on the other hand, their mains run fairly north of the present cholera field. The evidence so far seems to bear strongly against the East London water. Still, it may be only an accidental coincidence that the cholera and the water supplied by the company should be distributed over the same area. With regard, however, to the lowness of the district where the disease prevails, other regions in South and Central London are as low. And while, as to drainage, the incompleteness of the low-level sewer leaves a large part of the cholera field undrained, this is not so, we believe, in the Bethnal-green district, which is drained by the mid-level sewer, and in which 137 deaths from cholera have occurred up to July 28th.

We have gone over the waterworks at Old Ford, under the guidance of Mr. Greaves, the engineer, who kindly placed himself at our disposal for the time, and readily gave us such information as we sought. There is at Old Ford a large covered reservoir, which is in communication with the company's filter-beds at Lea-bridge by means of a four-foot iron pipe, which runs under ground on the east side of the Hackney-cut. From this reservoir is sent the greater part of the supply of water to the low-lying districts of the com-

pany's mains (the present cholera field). There are also at Old Ford two large open reservoirs, communicating with the Lea-bridge works by an open canal. These reservoirs and this canal lie east of the Hackney-cut. This canal and the open reservoirs are not used, we were told, at present for the water-supply, although they communicate with the covered reservoir, and therefore can be used on an emergency. This fact is much to be regretted, although it may be the case that this emergency never does occur. The covered reservoir lies west of the Lea, in what we cannot but feel to be dangerous proximity to the river, under which the iron feed-pipe from the filter-bed has to pass. However well the reservoir may be made, it is very difficult to keep water from oozing through brick and concrete. The water in the reservoir looked very clear, and exhaled nothing but a pure-smelling aqueous vapour. The latter statement would, however, we hear, not always be true. The open reservoirs have not long since been cleansed; and we are informed by an eye-witness from the Great Eastern Railway, which passes along their margin, that the matters removed were very offensive. From the filter beds at Lea-bridge the water is supplied direct to the mains of the high-lying district, the excess supplied flowing down to assist in supplying the low-lying districts. This may serve to explain the non-extension of the cholera field to the north and high part of the East London water field. Of course it can only do so on the condition that the water received in the lower districts differs in quality from that in the upper, either by the supply to the upper districts being purer, or by deposits having collected in the lower mains, and being swept on with the water when it is turned on to the houses. At any rate, the connexion of the difference of supply with the difference in the prevalence of cholera is an important fact to be noted.

The East London Water Company take all their supply, we understand, for their filter beds at Lea-bridge from the river Lea at Ponder's-end, more than two miles above the bridge, by a cutting running down to their works; but their works have also a communication with the river at Lea-bridge by means of wired lock-gates which rudely strain the water which flows through them.

The sewage of Edmonton, the refuse from a gasworks and from a crape manufactory, are received into a cutting made by the company to intercept its course into the river until it gets to below Tottenham, where, together with the sewage of this place, it then enters the river—that is, at the point above Lea-bridge, but below Ponder's-end. At Ponder's-end, our informant tells us, the water seems clear and good; near and above Lea-bridge, carcases of animals were observed in the water. It is needless for us to mention the filthy state of the river below Lea-bridge.

Now with regard to the state of the water. We must for present information on this matter turn to the analysis made under the superintendence of Professor Frankland, and published by the Registrar-General. We shall convert the numbers representing parts in 100,000 of water into the more familiar statement of grains per gallon.

East London Water.	Total solids per gallon.	Organic and other volatile matters.	Oxygen required to oxidize the organic matter.
Average of a year	19·55 grs.	1·13 grs.	·0353 grs.
Collected July 1st	17·07 "	1·36 "	·0241 "
Collected Aug. 1st	18·30 "	1·01 "	·0230 "

These results can hardly be said to afford any very important indication. For while the organic and other volatile matters were so largely above the average quantity on July 1st, the oxidizability of the water was at that time below the average. On August 1st both the amount of the organic matters and the oxidizability of the water were below the average, particularly the latter. The condition of the water as indicated by these results is as good as that of the Thames Companies' supplies, but it is decidedly inferior to that of the New River Company, which derives its supply in part from the Lea.

The presence of organic matter in water is no actual proof of its unfitness for human consumption; much less can the relative quantity of organic matter be taken as an indication of the degree of its unfitness. It is the *nature* of the organic matter which is of importance. These matters, or the product of their change, may interfere with the healthy action of the body without exciting any specific disease, or they may be the means of conveying a contagious disease. In the latter case, they must of course be of animal origin, and usually of human origin. It is in this way that water is believed to excite cholera—namely, by conveying organic particles from a cholera patient to another person. From this possibility of the organic matter derived from human beings being capable of exciting in a person the disease of him they come from, they are to be looked upon with exceeding suspicion and dread. Besides which, they usually possess the putrefactive quality to a very much greater extent than organic matter derived from the vegetable kingdom, so as to be largely armed with all the deleterious power of this decaying vegetable matter.

The surest way of determining the human or other origin of the organic matter found in a sample of water is to trace the history of the water. But at times microscopic observation serves to detect animal matter in water, if it be in the solid state; while the detection of nitrogen in the organic matter, or of this substance, as ammonia or nitric acid in material quantity in the water, renders the past or present occurrence of animal matter in the water probable. As a rule, the detection of nitrogenous organic matter in water may be considered to prove it to be a noxious beverage. The presence of ammonia or nitric acid does not indicate that the water has baneful properties, but it shows that nitrogenous (probably animal) matters find their way into the source from which the sample was taken, and the danger therefore of using such water for fear that at any time the change of these matters into such harmless bodies as ammonia and nitric acid may not have taken place.

The atmosphere is the great purifier of water, partly by the chemical action of its oxygen and ozone, and partly by its removing gases and vapours from the water by diffusion. But there is no certainty as to what degree of exposure is sufficient thus to purify water. Many persons consider the atmospheric purification of water to take place very rapidly, while Sir Benjamin Brodie, Professor of Chemistry at Oxford, in his evidence before the Royal Commission appointed to inquire into the Pollution of Rivers, states his opinion to be that it is simply impossible for the oxidising power of the atmosphere over sewage running in mixture with water over a distance of any length to be sufficient to remove its noxious quality, and that the noxious quality imparted to the Thames water by the sewage of Oxford is not removed by the time this water reaches Teddington Lock (above which the Thames Companies draw their supplies for London). This, it must be remembered, is the opinion of one of our most profound chemists, but we cannot but feel that in it the powers of the atmosphere are decidedly underrated.

There is one property which all physiology serves to show organic matter must possess to be active in developing vital actions, and that is a tendency to undergo *change*—the property of chemical instability. Now, this property is possessed by organic matter—more especially animal matter—pretty nearly in proportion to its power of undergoing oxidation. Hence, matter not easily oxidized can have but little action on the body, so that its presence in water is of comparatively little importance, while the presence of readily oxidizable matter is of correspondingly great importance. Now, readily oxidizable organic matter will often take oxygen from things that it meets containing it—converting, for instance, sulphates into sulphides, and nitrates into nitrites. So that the presence in water of these salts and other allied bodies, as well as of oxidizable matters, is a probable evidence of the powers of the water to cause some effect on the human organism for good or for evil, and much more likely for the latter. The oxidizability of the constituents of a drinking-water is therefore a material point to determine, and forms an important part of the examination of a drinking-water. It is since the outbreak of cholera in 1853-54 that an available means of

doing this has been made out. In respect of this point, the East London water contrasts favourably with that of the Thames Companies.

Before closing our present remarks on this part of the subject, we are anxious not to pass over the methods we have of freeing our drinking-water from possibly dangerous impurities. Thorough filtration is indispensable, because not only does it remove some of the impurity, but probably some of the most active part of it, since different considerations serve to render it likely that solid particles of organic matter are more powerful for harm than organic matter in solution. But filtration alone is insufficient. Boiling the water is a well-known means of purifying it; but this, besides usually rendering the water vapid to the palate, cannot, in the opinion of many scientific men, be relied on.

The Registrar-General's report contains two recommendations from Professor Frankland—one, the admixture of permanganate of potash with the water; the other, the use of animal charcoal filters or purifiers at the waterworks. He calculates that 300 tons of bone-black would be required between all the metropolitan water companies which would serve for at least three months—perhaps for a year—to remove the whole of the organic matter. Its employment he considers to be neither formidable nor expensive. He calculates that if the permanganate be employed, 80 lb. ought to be mixed with 1,000,000 gallons of water—a calculation that indicates the requisition of 8000 lbs. of this substance per diem to purify the water supplied to London. This method would not only be of enormous expense, but it would render the water turbid should any of the permanganate pass unchanged through the filter-beds.

Our own recommendation is to employ Mr. Spencer's "magnetic carbide"—a form of magnetic oxide of iron prepared by him. This substance is stated by him to cause the oxidation of all the organic matter in water without losing its power by use. It is equally applicable, we believe, to the filter-beds of a waterworks and to the house-filterer. Of our own knowledge of its power we can speak thus far: one of his domestic purifiers *thoroughly* oxidized the water supplied by one of the Thames companies, and this after a month or two's use as well as at first. The test of oxidizability of the water before and after purification was the permanganate of potash solution. The colour of the water caused by the organic matter was also removed by this purifier. In this material, then, lies a means of purifying water at a trifling cost at the waterworks. And in Spencer's water purifiers for domestic use (obtainable at Euston Square), or in the filterers of the London Water-purifying Company (Strand), as mentioned by Professor Frankland, such persons who can afford the necessary outlay have what may be looked upon as a safeguard against drinking-water containing oxidizable organic matter.—*Lancet*, *Aug.* 11, 1866, *p.* 157.

109.—CHOLERA AND IMPURE WATER.

By Dr. F. P. Atkinson, Rochester.

It has been clearly shown, I think, that the present outbreak of cholera has been due in a great measure to the supply of bad water, and there is good reason to believe that the same cause has been at work in nearly all, if not all, previous epidemics. There was one remarkable instance, at any rate, in the epidemic of 1849. The Wandsworth-road, as it is well known, was most severely visited at that time, and one part of the eastern side was attacked with such virulence that in a short time there was not a house where there was not one dead. In some cases there was not one person living, and the dead were actually left to bury their dead. The opposite side of the road, however, scarcely suffered at all, which led people to guess that the origin of the disease was to a certain extent local: and when they found that the two sides were supplied by two different water companies, they naturally enough began to blame the water. As it turned out afterwards, they

were perfectly correct; but they little imagined they had all along been poisoning the water themselves. On examination of the cisterns, it was found that the pipes which ought to have conveyed water solely for the purpose of cleansing the closets, allowed the excreta, etc., on certain occasions to regurgitate and infect the water which was used for drinking and other domestic purposes. This was the origin of the cholera on the eastern side, and the same cause not being at work on the western side, it escaped. Of course the bad water, *per se*, was not the originator of the disease, but it acted as a predisposing cause, and rendered the people more liable to it when the time came.—*Lancet, Sept.* 29, 1866, *p.* 371.

110.—CASE OF SPASMODIC CHOLERAIC DISEASE SUCCESSFULLY TREATED BY HOT-WATER PACKING.

By F. A. Bullar, Esq., Senior Surgeon to the Royal Berkshire Hospital, Reading.

Thomas P., aged 40, a county police constable, residing at Maiden Erleigh, near Reading, a temperate man, and previously in good health, was attacked while walking on his beat, about one o'clock p. m., on Thursday, August 2nd, with sudden violent pain in the abdomen, followed almost immediately by tonic painful spasm of the abdominal muscles, and a sensation as if his intestines were being drawn up in knots. It was not accompanied by any particular feeling of sickness, nor had he had any previous diarrhœa. The symptoms had been gradually increasing in severity until I saw him—about half-past three the same day—when I found him writhing with the most excruciating pain. The abdominal muscles were universally hardened and contracted by spasm, somewhat resembling tetanic spasm, but more continuous and unrelaxing, and extremely sensitive to the touch. The most intense pain was just in the epigastric region, extending backwards to the spine, as if the diaphragm was affected with the spasm. He was in a cold, clammy perspiration, pulse feeble, and he was beginning to feel extremely faint. I immediately ordered the abdomen to be fomented, and the flannels, wrung out of water as hot as he could bear, having been applied three or four times, his body was enveloped in blankets to the number of five or six, the outer one being closely wrapped round his neck, to confine the heat generated by the wrapping, and to take the following draught every two or three hours:—℞. Elixir opii (Newbery's) ℥x.; tinct. capsici ℥v.; olei menthæ virid., olei anisi, āā ℥ij.; confect. aromat. ʒj.; aquæ menthæ pip. ad ʒjss. M. ft. haust. To take a little brandy-and-water occasionally.

On visiting him about two hours afterwards, I found him lying in a profuse perspiration, which, with the medicine, had much relieved, but not quite removed, the pain. The rigidity of the abdominal muscles had greatly subsided, and he altogether felt much more comfortable.

About 7 p. m. he had another attack of pain, but not by any means so severe as the first, for which his wife again fomented him and repeated the medicine, which again relieved him, some little amount of abdominal hardness, however, continuing. About 12 at midnight he had another attack, when his wife again packed him up in the wrappings and repeated the mixture. Shortly after this, while in the perspiration induced, he fell asleep, and on awaking about an hour afterwards he found the pain had left him, the abdominal spasmodic hardness had become quite relaxed, and he felt in every respect much better.

Friday, next morning. He is quite free from pain and spasm; feels very weak, but the pulse has recovered its strength, with a natural uniform warmth of the body. In the afternoon he was apparently free from all symptoms of the disease, except that he felt somewhat languid and faint. Ordered to take cold strong beef-tea and small quantities of brandy-and-water for drink, and the following mixture should the pain or spasm return:—℞. Chlorodyn. ℥xl.; aquæ menthæ virid. ad ℥vi. M. ft. mist. Take a fourth part if necessary.

Next day the patient had apparently quite recovered from his complaint.—*Medical Times and Gazette, Aug.* 11, 1866, *p.* 139.

111.—CASE OF ASIATIC CHOLERA SUCCESSFULLY TREATED BY NITROUS ACID; WITH REMARKS.

By Dr. G. E. Nicholas, Medical Officer of Health for Wandsworth.

[In 1850, cholera was continuously present for six months in the Mediterranean squadron, and every mode of treatment, eliminative or astringent, was tried and found of no use except that by nitrous acid.]

During the epidemic in this country in 1854, it underwent at my hands, and at those of my colleague, Dr. Whiteman, of Putney, the rigid test of a general administration. The results of treatment in my subdistrict were as follows:—viz., in 659 cases of diarrhœa, choleraic diarrhœa, and cholera, there were fifty-eight cases of collapse of which five were moribund when visited, and consequently not under treatment, and twenty-nine recovered.

This is not a time for founding a theory of rational Medicine upon which to build an experience. Experience of treatment and of remedies must seek—though, as is too often the case in Medicine, it cannot command—an explanation of their *modus medendi*.

Whether the eliminative mode of treatment be right in theory but wrong in practice, or whether, conversely, the suppression of the diarrhœa be wrong in theory but salutary in practice, may be left to the mental profundity of censors of Colleges; but, as a matter of fact and experience, there must be many by this time whose experience of its use will bear out the assertion that the nitrous acid will speedily arrest the diarrhœa and its concomitant symptoms, and that such suppression is never followed (in uncomplicated cases) by the very unmanageable consecutive fever which usually occurs when it has been effected by opium alone or combined with the usual astringents; and, moreover, that in cases of collapse, when vomiting and purgation are at an end, it will cause reaction when no other remedy—not even castor oil—will avail to do so.

The formulæ I have used are the following, viz.:—℞. Acidi nitrosi ʒ j. (the deeper the colour the better); aquæ ℥ viij. M. ft. mist., cujus cochl. magnum ex aquæ cyatho vinosa post singulas sedes liquidas sumendum est. Si sit dolor, adde tinct. opii ʒj.; si sint spasmi, ætheris chlorici ʒj. Sed si sit vomitus, acidi gallici gr. ij. ad. iij. imprimis sumenda sunt.

As an illustration of this treatment, I beg to add the following short notes of the only case of cholera which has come under my notice in this subdistrict up to the present time.

Case.—T. R., aged 61, labourer, employed lately in digging mud from the bed of the Wandle, &c., and previously in the manufacture of artificial manure. On Sunday, August 12, was taken, at 4 a. m., with vomiting and purging incessantly. Had been drinking overnight. ℞. Acidi gallici gr. ij., c. pulv. Doveri gr. v., st.; mist. acidi nitrosi, ut opus sit; turpentine fomentation to stomach, and hot water and turps to the feet. 1.30. Cold surface; pulse scarcely perceptible, cannot be counted; speaks in a whisper, skin dusky blue; features shrunken; stools rice-water, but pinkish from admixture of blood, like sanious lymph; cramps very severe; tongue has a thick white fur. Repetantur remedia omnia. 3 p. m. Has had four motions, and been sick three times. Pulse 120; more heat of surface; less cramp. 7 p. m. Better; pulse 100, fuller; has vomited three times, and been purged four times, but in less quantity; warmth of the skin restored; skin bluish red in colour; voice louder. To have some thick arrowroot and brandy, and raw extract of meat, and plenty of it, but little at a time. Continue remedies. 10 p. m. Informed by message that he was still improving, and had been purged but little. Medicines to be used as required.

August 13, 11.30 a. m. Has passed a restless night; four stools, the last has fæcal odour, and blackish from the gallic acid (no doubt); sick once this morning; passed a little water at 10 a. m.; pulse 90, fuller; skin dark red; tongue cleaning. 5 p. m. Going on favourably. Continue mixture as needed; same nourishment.

14th. Pulse 85; still weak; has had five stools, but small in quantity, evi-

dently contain bile; feels comfortable; no cramp since yesterday, and no sickness. Continue.

15th. Progressing favourably. Pulse 72; tongue cleaner. Continue.

16th. Progressing. Continue; four ounces port immediately.

17th. Convalescent, but very weak. Continue same diet, &c.

18th. Suffering from nothing but debility. Fish, yolk of egg, milk, and gravy-tea for diet. Continue wine.

20th. Stronger. To have mutton in place of gravy-tea.—*Medical Times and Gazette, Aug.* 25, 1866, *p.* 193.

112.—CASE OF CHOLERA WITH COLLAPSE—TREATMENT BY CASTOR OIL—RECOVERY.

By Mr. Shaw, House-Surgeon to the St. Pancras and Northern Dispensary.

[The patient was a woman forty-five years of age. When first seen, on July 20, she was in a state of collapse, with cramps in the feet and legs, and to a less degree in the stomach and bowels.]

Ordered to have hot applications to the surface of the body and extremities, and the following mixture:—℞. Olei ricini ʒvj., mist. acaciæ ad ℥iij.; half to be taken every two hours. Warm tea was given to drink, but all alcoholic stimulants were prohibited. 10 p. m.—Been sick after each dose of the medicine, the vomit being brown and very fluid; bowels opened three times, the evacuations very fœtid, and not a trace of bile in them; no urine passed; difficulty of respiration very great. Ordered—Olei ricini fl. ʒiv., mist. acaciæ fl. ℥ij.; half to be taken every two hours. Owing to the great thirst, iced water was given to drink. 12 p. m.—Had retained the first dose of the last mixture, but vomited the second; bowels opened once since 10 p. m., no bile in the evacuation; great depression; pulse 84. Ordered to have beef-tea and the following mixture:—℞. Olei ricini fl. ʒiij., mist. acaciæ fl. ℥iij.; one third to be taken every two hours.

July 21. 6 a. m. Skin much warmer; blueness of face gone; no cramps, and respiration much easier; bowels opened twice since midnight; there was some yellow bile in the last motion; vomited green bile once since last night; pulse 90; no cold sweating; passed some urine; ordered to have more beef-tea, and to continue the iced water. 4 p. m.—Going on very comfortably; bowels opened once since 6 a. m.; much biliary colouring in the evacuation; no vomiting; skin warmer; no cramps; complains of great "weakness;" voice much stronger. Ordered—Quiniæ sulph. gr. ij., acid sulph. dil. ♏vj. aquæ fl. ℥j. To be taken every four hours.

The evacuations after this date were of a much more natural colour, and the patient, though much exhausted, continued to progress favourably; the voice finally recovered its natural force and quality.—*Medical Times and Gazette, July* 28, 1866, *p.* 89.

113.—RESULT OF THE TREATMENT OF NINETEEN CASES OF CHOLERA BY CAMPHOR.

[The following particulars are reported by Mr. Widdas, who, along with Mr. Richardson, had charge of the cholera patients at the Whitechapel Workhouse Infirmary.]

During the last twelve days, nineteen of the cholera cases admitted into this union have been treated with camphor; of this number, six have recovered, nine have died, and the remainder are at present under treatment.

We administer the camphor by dissolving it in an equal weight of chloric ether, giving fifteen or twenty drops of the solution on sugar in the first instance, and ten drops every quarter or half-hour afterwards, according to the urgency of the symptoms. In about half the cases in which this treatment has been adopted, the patients have appeared to receive benefit in periods varying from six to eighteen hours. The extremities have gradually become

warmer and lost their lividity, bile has reappeared in their evacuations, and the patient has passed into a state of reaction. During this second stage two died—one, a girl aged 13 (who was suffering from severe gonorrhœa), with symptoms of congestion of the brain, and the other of pneumonia. Six have gradually recovered, without any bad symptoms.

Of the remaining half which died, some were almost in a dying state when admitted, and one was suffering severely from secondary syphilis. And in some cases, even when the treatment was begun early, the camphor did not seem to have the slightest good effect, and the patients died collapsed in a very few hours.

Brandy has been freely administered to each, and ice has been given to suck, also effervescing mixtures and astringents incidentally.

All have been well-marked cases of Asiatic cholera, having the rice-water evacuations, coldness and lividity of the extremities, and in most cases the patients were pulseless when the treatment was commenced. In one woman, aged 57 years, after recovering from a state of collapse, and about four days from the commencement of the attack, a rash was observed all over the body, and most resembling that of measles, but on the following day the rash assumed a bright rosy red colour, strongly contrasting with the dusky red in measles. The rash remained about three days, and gradually disappeared. The woman is fast recovering. I may mention that all these cases have been adult women, varying in age from 13 to 70 years.—*Medical Times and Gazette, Aug.* 4, 1866, *p.* 118.

114.—SUCCESSFUL TREATMENT OF CHOLERA.—CAMPHOR.

Mr. Frederick Smith, of York House, Penzance, writes to us detailing a method of treatment, pursued at Naples, by which in 592 cases not a single death occurred.

Happily, the remedy in question is one which has been employed by all the medical schools, and can give rise to no angry debate. The dominant school, sometimes called allopathic, have used it; and that comparatively small section of the profession called homœopathic is also in the habit of prescribing it. But neither party, as a school, has thought of preparing it in the way in which Dr. Rubini—the author to whose labours in this cause I am about to refer—has found so invariably successful. For example, the ordinary spirits of camphor of the British Pharmacopœia consists of one part by weight of camphor to nine parts of spirits of wine; the homœopathic preparation of one of camphor to five of spirits of wine; whereas, Dr. Rubini's preparation consists of equal parts by weight of camphor and spirits, and to the power thus obtained he attributes his success in the treatment of the disease. And here I may say that the quantity of camphor which water will take up is small. To obtain, therefore, the "saturated spirits of camphor of Rubini," it is necessary to distil spirits of wine, and get rid of so much of its water as will bring it to 60° overproof, in which condition it will dissolve and hold in solution its own weight of camphor.

With this "saturated spirits of camphor," Dr. Rubini, an eminent Neapolitan physician, has treated in Naples 592 cases of Asiatic cholera without the loss of a single patient. Of these 592 cases, 200 were cured in the Royal Alms House, 11 in the Royal Poor House, and 166 in the Third Swiss Regiment of Wolff. That the 377 cases treated by Dr. Rubini in these public institutions were all genuine cases of Asiatic cholera, and some "terribly severe," and that all recovered, the evidence of the following distinguished individuals, with their official seals attached, sufficiently attest:—Il Generale Governatore Ricci, Il Maggiorie Commandante Nicola Forni, Il Capitano Commandante Carlo Sodero, Generale Commandante Fileppo Rucci, Colonel Eduardo Wolff.

"The method of cure" is as follows:—"When a man is seized with cholera, he should at once," says Rubini, "lie down, be well wrapped up in blankets,

and take every five minutes four drops of the saturated tinc'ure of camphor. In very severe cases, the dose ought to be increased to from five to twenty drops every five minutes. In the case of a man of advanced age, accustomed to take wine and spirits, where the drug given in drops has no effect, give a small coffee-spoonful every five minutes, and in a very short time the coveted reaction will occur. Ordinarily, in two, three, or four hours abundant perspiration will come out, and then cure will follow."

"The preventive method," writes Dr. Rubini, "is this: let those who are in good health, while living in accordance with their usual habits, take every day five drops of the saturated spirits of camphor upon a small lump of sugar (wa'er must never be used as a medium, or the camphor will become solid, and its curative properties cease), and repeat the dose three or four times a day. Spices, aromatic herbs, coffee, tea, and spirituous liquors should be avoided." —*Medical Press and Circular, Aug.* 2, 1866, *p.* 140.

SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOLLOWING PAGES; SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

AFFECTIONS OF THE SYSTEM GENERALLY.

CANCER.—Dr. Broadbent looks upon cancer as primarily a local error of nutrition, in which not the blood but the part is at fault. It may be said to be constitutional, just as almost every disease is, in a sense, constitutional; but he does not believe in any condition to which the term "diathesis" is applicable, except such as is created by the existence of a tumour as a centre of dissemination. (p. 261.)

Destruction of Cancer by Injection of Acetic Acid.—Cancers can be treated by injection of acetic acid into their substance, either with the view of disintegration being followed by absorption without breach of surface, the tumour dwindling away gradually; or with a view of causing destruction of the growth with discharge of the débris. When the skin is involved, or when the tumour is of large size and rapid growth, absorption is not to be expected. When absorption is the end in view, we must not inject too much acid, nor too strong, at once, and we must not repeat the injection for some time, for absorption is a slow process, often requiring months. When destruction is the object, the injection should be most thorough, and the acid strong, so that the entire disease may be removed at once. When the skin is broken, our best opportunity is gone, for the acid escapes and less effect is produced. (Dr. W. H. Broadbent, p. 259.)

Inject a dilute acetic acid into the centre of the tumour by means of a subcutaneous injection syringe. The needle should be introduced through the sound skin an inch or more from the part involved in the disease. About thirty minims of dilute acid (one part of acid to one and a half or two of water) is the proper quantity for injection. Very little pain is produced. The whole tumour may be gradually destroyed by repetitions of this proceeding. When the larger portion of the tumour has been destroyed and a cavity produced, it may be stuffed with lint soaked in dilute acid until every vestige of cancerous matter has been destroyed. Dr. Broadbent considers large quantities of dilute acid preferable to stronger acid; and he would not, without great hesitation, attempt the destruction of any tumour which had not involved the skin. (Dr. W. H. Broadbent, p. 41.)

A case is related in which acetic acid was injected into a cancerous tumour of very large size, occupying the side of the face and neck. The patient was 73 years of age. Forty minims of acid, of the strength of one part in four, making 80 minims in all, were injected at two points. The operation gave no pain. More than one-half of the tumour was destroyed by this, and a large wound produced. The remains of the tumour only occupied the face, where numerous hard nodules could be felt. These nodules were treated separately by injections, and poultices containing acid were applied to the wound. At the period when the case was reported it could not be considered cured, but the wound was contracting and filling up with granulations. A mass was left over the maxillary and malar bones which it was difficult to treat by subcutaneous injections. (Dr. W. H. Broadbent, Dr. Randall, p. 164.)

Destruction of Cancer by Electricity.—By means of the chemical action of the continuous galvanic current, apart from the cauterising action of the same agent, a slow and gradual disintegration of living tissue may be brought

about. This is applicable for the disintegration of cancerous tumours. The negative pole of the battery must be applied to the tumour and the positive at some distance from the diseased part. The parts acted upon form an eschar which slowly separates, without pain or reaction, leaving a soft and yielding cicatrix. (Dr. J. Althaus, p. 264.)

FEVER.—*Aconite as a Febrifuge*—In cases in which there is increase in the heart's action, aconite may be employed with advantage as a febrifuge, instead of salines. It has in such cases the power of reducing the pulse and relieving the whole train of febrile symptoms. All cases characterised by nervous excitement and those in which there is palpitation are relieved by aconite. For an adult, two drops of the tincture (P. Lond.) every three or four hours is a proper dose. It may be mixed with powdered sugar and laid on the tongue. The sensation of "pins and needles" shows that the drug is acting on the system, and on the appearance of this symptom it should be discontinued or the dose diminished. (Dr. Prosser James, p. 202.)

Delirium in Fever, is it from head affection or from exhaustion?—When, towards the termination of a case of fever, the thermometer indicates a normal temperature, when perhaps the pulse is frequent, the patient constantly delirious, and the mouth black with sordes, it shows plainly that these symptoms are not the result of cerebral inflammation, but depend, in all probability, on exhaustion; hence, nutrients and stimuli appear the rational curative agents, *versus* leeches, cupping, and other lowering remedies. (Dr. J. S. Water, p. 18.)

GOUT.—*Hydrochloric Acid.*—A disordered digestion is the *primum mobile* of the whole train of morbid phenomena. This leads to imperfect performance of the function of respiration, whereby uric acid accumulates in the blood (it would otherwise be oxidized into urea, and excreted). Hydrochloric acid is a remedy of great value in some of these cases, it is the natural acid of the stomach, and when given along with food considerably increases the digestive power of the stomach. Alkalies certainly neutralize the uric acid already in the blood, but they do not go to the root of the matter. The hydrochloric acid is not put forward as a specific to be used under all circumstances and in every stage of the disease. (Dr. J. F. Duncan, p. 242.)

RHEUMATISM.—Dr. Bennet, of Edinburgh, has paid considerable attention to the question of the spontaneous cure of rheumatism, and he comes to the conclusion that it cures itself in about the same time, without any medicine, that it does when alkalies are given. If any shortening of the time is effected, it is very inconsiderable. (Dr. J. Hughes Bennett, p. 40.)

Temperature in Acute Rheumatism.—In acute rheumatism we have a long continued slightly abnormal temperature, generally ranging between 99° and 102° Fah., and very rarely reaching 103° Fah. (Dr. T. A. Compton, p. 21.)

RHEUMATIC FEVER.—*Permanganate of Potash.*—Permanganate of potash, which may be given in the form of Condy's fluid, is a remedy of considerable value in cases of rheumatic fever. It cleans the tongue, relieves pain, acts slightly on the bowels, and removes turbidity and fœtor from the urine when they have existed. The Condy's fluid should be diluted with seven parts of distilled water, and of this half-an-ounce given every second hour. (Dr. J. F. Duncan, p. 203.)

Quinine.—Give two grains of quinine combined with five grains of iodide of potassium four times a day. At the commencement of the case, let the patient have a vapour-bath of vinegar with subsequent cold douche. This is managed easily in bed, by wrapping up two almost red-hot bricks in coarse flannel soaked in vinegar, and placing one at either side of the patient on plates, but one near the shoulder and the other as low down as the knee. The cold douche is important in order to prevent the subsequent weakening sweats. It was pointed out by Dr. Heberden, more than a hundred years ago, that there is considerable resemblance between ague and rheumatism, in the rigors, hot and sweating stages, and in the tendency to periodicity in both diseases. (Dr. J. B. Nevins, p. 38.)

SCARLATINA AND DIPHTHERIA.—*Chlorate of Quinia.*—From the powerful oxidizing and general stimulating agency of chloric acid, and the influence

of quinia as a nervine tonic, Dr. Lyons has been led to the idea of combining these two remedial agents, with the view of obtaining a febrifuge medicine of great potency. The results obtained from the use of this salt in doses of four grains every three hours, in cases of scarlatina and diphtheria, have so far been very satisfactory. It may be obtained from Messrs. Bewley and Hamilton, Dublin. (Dr. Lyons, p. 238.)

Scarlatina and Tonsillitis.—Diagnosis by Means of the Thermometer.—The diagnosis between tonsillitis and scarlet fever in their early stages is frequently very embarrassing, but we may derive much assistance by observing the temperature. In tonsillitis, the temperature in the middle of the day, when at its maximum, which is generally attained about the fourth day, rarely exceeds 101°·5 Fah.; and this occurs with a pulse often below 100. Normal is reached about the sixth or seventh day. In scarlet fever, on the other hand, the maximum is arrived at about the third day, when the temperature is generally 104° Fah., whilst the pulse is considerably above 100. The normal is not usually attained until the tenth or twelfth day. (Dr. T. A. Compton, p. 21.)

Temperature in Health.—A temperature of 98°·4 Fah. is the point generally settled upon by the majority of authorities on the subject as the average in healthy adults. This is probably too high. The healthy range is somewhere between 95°·5 and 98°·5 Fah., the most common temperature met with being probably 97°·4 Fah., *i. e.*, one degree less than the temperature hitherto most generally received as the normal one. (Dr. T. A. Compton, p. 19.)

Effects of Alcohol on the Temperature of the Body.—Alcohol, when taken by persons in health in ordinary quantities, causes a depression of the temperature of the body. The amount of depression is, however, slight and not sufficient to contraindicate its use. In poisonous doses, the depression is more marked, amounting to about three degrees. From many observations made to ascertain the influence of alcohol on the temperature of febrile persons, it results that alcohol causes only a slight and temporary depression of their temperature, and consequently that it cannot bring the temperature of febrile patients to that of health. (Dr. Sydney Ringer and Dr. W. Rickards, p. 30.)

Typhus and Typhoid Fevers.—*Thermometry in.*—The thermometer is, as its indications are becoming better understood, assuming an important place in our means of diagnosis and prognosis, both in fevers and most acute diseases. In both typhus and typhoid the temperature rises in a more or less regular manner to its maximum on the seventh or eighth day, when it gradually falls. In typhoid an abnormal course of temperature much more generally precedes a fatal termination than any unusually high range. The approach of any complication may frequently be foretold by a rise in the temperature. Fatal cases of typhoid have a temperature of about 104° Fah. as late as the sixteenth day, when, even in severe cases, the normal ought to be nearly reached. (Dr. T. A. Compton, p. 26.)

As a general rule, the temperature of the body rises high in *typhoid* fever in the first week, while the pulse remains comparatively low, and this is not the case in typhus, or in many of those diseases for which this fever is apt to be mistaken in its early stage. In typhus fever the pulse and temperature rise together till the fever reaches its climax, when the pulse ranges generally from 110 to 144, and the temperature from 102° to 104°·5. There are, however, many exceptions to this rule; thus occasionally in febricula, acute rheumatism, tonsillitis, exhaustion from suckling, and pthisis pulmonalis, a temperature of 102° or 103° may occur with a low pulse rate. Perhaps the cases of enteric (typhoid) fever in which the diagnostic use of the thermometer is most striking, are those in which malaise and perhaps some diarrhœa have existed for several days, and yet the patient has got about. Again, in many cases of supposed typhus, with history of exposure to infection, a rigor, a muddy skin, rapid pulse, and furred tongue, the fact of the temperature at mid-day being below 99°·5 or 100° is sufficient to enable us to assure the patient that he is really free from typhus. (Dr. J. S. Warter, p. 17.)

The most important rules that can be derived from the records of a single daily temperature are two; namely, that a sudden rise of temperature in

either indicates some intercurrent disease, as congestion of the lungs, and that a sudden fall of the thermometer in typhoid fever indicates either diarrhœa or hemorrhage. (Dr. J. S. Warter, p. 18.)

In typhus the pulse and temperature rise more or less together until the seventh, eighth, or ninth day, when they are at their highest, then they begin to decline, and drop down steadily day by day in unison, both becoming normal about the fifteenth or sixteenth day. In typhoid fever, however, all is chaos; the pulse and temperature rise and fall irregularly, taking separate and distinct courses. Both, however, remain, on the whole, moderately high from about the sixth to the fifteenth day, then a fall takes place pretty rapidly, and between this and the twentieth day the normal mid-day temperature is again reached in most cases. (Dr. J. S. Warter, p. 18.)

AFFECTIONS OF THE NERVOUS SYSTEM.

DELIRIUM TREMENS.—*Capsicum.*—Let thirty grains of capsicum be made into a bolus and swallowed at one dose. It sometimes has an excellent effect, being of great and immediate efficacy. (Dr. Lyons, p. 69.)

EPILEPSY.—*Chloroform.*—Though theory at first contra indicated the administration of anæsthetics, subsequent experience has fully established the fact, that, contrary to presupposed views, chloroform in full doses controls the epileptic fit, and while good breathing is kept up there is no cause of apnœa, or alarm from suffocation. (Dr. Kidd, p. 201.)

FACIAL PARALYSIS.—*Electricity.*—In employing electricity for the cure of Bell's paralysis of the portio dura, the induced current must be used and perseveringly employed by means of wet sponges, and pointed metallic conductors. (Prof. Aquila Smith, p. 214.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ANEURISM.—*Acupressure.*—Mr. Henry Lee proposes to employ acupressure for the treatment of popliteal and other aneurisms which are accessible to the needles. The popliteal artery may be compressed without much difficulty by this means. A successful case is related. Mr. Lawson Tate has treated aneurism in the way proposed by Mr. Lee for six or seven years. He dissects carefully down as for the application of ligature. If pressure is kept up too long, suppuration may result. The essential condition for success is that the inner coat of the artery should *not* be lacerated, for if the two sides of the artery be kept together for a few hours they will unite. If the needle be passed through a vein, embolism will probably result. (pp. 218, 219.)

HEART DISEASE.—*Epistaxis.*—Mitral narrowing has a greater tendency than any other valvular lesion to give rise to hæmoptysis. It may sometimes, when taken along with other symptoms, be an aid in diagnosis, especially as there is often wanting the murmur which is so audible and diagnostic in other forms of valvular disease. (Dr. Hyde Salter, p. 248.)

PULSE.—*Effects of Alcohol on.*—Alcohol increases the force of the pulse, but lessens its frequency. (Dr. S. Ringer, p. 31.)

PYÆMIA AND PHLEBITIS.—There is no necessary connection at all between pyæmia and phlebitis; it is indeed very rare to see pyæmia following upon well-marked phlebitis during life, even when a vein and its branches are quite closed by coagulum or adherent fibrine. In the worst cases of pyæmia, the veins are generally found perfectly healthy. In some cases of thrombosis, a puriform fluid is found in the veins; this, however, is softened and disintegrated fibrine, and is, although to the eye almost indistinguishable from pus, really quite distinct from it, and possibly a *post-mortem* effect in some cases. (Mr. W. S. Savory, p. 181.)

THROMBOSIS AND PHLEBITIS.—Phlebitis is an inflammation which really

affects the walls, and not the contents of a vessel. In the larger vessels, the different layers of the walls become inflamed and thickened, but all the while the channel may remain perfectly unaltered. No experiments have succeeded in producing a deposit in the cavity of the vessel when all blood is excluded from its interior. On the other hand, in most cases of thrombosis, there is no mark of inflammation in the coats of the vein, and in all the deposit on its walls can be readily peeled off, which it could not be were it an exudation from the walls of the vessel. Thrombosis, then, may occur without phlebitis, and phlebitis without thrombosis; but thrombosis without phlebitis is of more frequent occurrence than phlebitis without thrombosis, for phlebitis is a frequent cause of thrombosis. Thrombosis sometimes occurs without any explainable cause, the vein being perfectly healthy, and no other possible cause assignable. A thrombus is distinct from an embolus; the former is a clot formed in a vein; the latter is a piece of detached fibrine from a clot formed in a vein, or from a deposit on the valves of the heart, carried into the circulation and blocking up some artery into which it is carried. Virchow's theory of pyæmia (probably erroneous) is, that embolism always precedes pyæmia, and that the numerous secondary abscesses are formed by small granules of fibrine blocking up distant capillaries and there softening and forming abscess. (Mr. W. S. Savory, p. 183–185.)

AFFECTIONS OF THE RESPIRATORY ORGANS.

ASTHMA.—There is a great difference, generally, between the causes of the disease and that of the paroxysm. The disease itself is generally excited first of all by bronchitis, and subsequent attacks of bronchitis may produce fresh paroxysms of the asthma. The excitants of the paroxysm may be divided into direct excitants, as things inhaled, an inflammatory condition of the bronchial mucous membrane, the presence of a blood—such as *sanguis cibi*—the blood after a meal, which, though not itself necessarily morbid, yet, in the peculiar pulmonary system of the asthmatic, constitutes a source of irritation. The other division of excitants includes those which are applied to the peripheral of the nervous system, as an indigestible meal, a loaded rectum; or such as affect the brain itself—either physical or psychical. The presence of animals, such as cats, dogs, horses, &c., has, by the effluvium from their bodies, sometimes the effect of inducing an attack of asthma in those subject to the disease. This peculiarity may be quite unsuspected by the patient. An instance is given in which the proprietor of an equestrian establishment was constantly subject to attacks of the disease until he retired from the business, when he became free from them, but if he goes back to his old haunts among the horses his old troubles recommence. Another gentleman was unable to sleep in any house in which was a dog. (Dr. Hyde Salter, p. 83.)

CATCHING COLD.—Cold does not so much arise from exposure to cold as from going from a moist cold atmosphere into a hot dry one. In coming home after being out in cold inclement weather, it is well for a person liable to catarrh to loiter a little in the hall before going into a heated room. (Dr. T. Inman, p. 38.)

DIPHTHERIA.—When the exudation is fairly manifested, the most efficient local application is strong hydrochloric acid, diluted either with honey or with water, in equal bulk. This may require repeating once or twice again, at an interval of twelve or twenty-four hours. If much fœtor exists, a tolerably strong solution of chloride of zinc may be applied to the throat, and a solution of permanganate of potash employed to cleanse the mouth from stringy saliva and offensive discharges. The use of nitrate of silver as a caustic is unsatisfactory. The class of internal remedies from which most good may be expected is preparations of iron, given from the very commencement of the disease. The ordinary tincture of the sesquichloride is for several reasons the most suitable preparation. Stimulants should be used early and

without hesitation; as, in cases of fever, the first-noted feebleness of the heart-beat, or softness and rapidity of the pulse, furnish full reasons for their employment. (Dr. W. Newman, p. 87.)

HEMOPTYSIS.—*Insufflation of Dry Sulphate of Iron.*—In a remarkable case of hemoptysis related, the repeated insufflation of small quantities of persulphate of iron, very dry, and reduced to an impalpable powder, completely arrested the hemorrhage. Lead, opium, and the usual remedies had failed to give relief. (Dr. W. A. Wetherby, p. 127.)

HOOPING-COUGH.—In some aggravated cases of hooping-cough, the inhalation of chloroform proves very beneficial. (Dr. C. Kidd, p. 201.)

PHTHISIS.—*Hygienic Treatment.*—Many medical men, instead of regarding the progressive deposit of tubercle in the lung, with its preceding or accompanying bronchial and laryngeal symptoms, as mere local manifestations of a general diathesis, exaggerate their inflammatory nature, and do not apply to their patients the ordinary rules of hygiene. They dare not give wine and plenty of animal food; they dare not give fresh cool air day and night; and they dare not keep the skin cool and clean by cold or tepid sponging. All consumptive patients, whatever their condition, if they have the strength, should use a sponge-bath at a temperature of from 64° to 68° daily. The greatest possible benefit will be derived from this, the pulse will be lowered, and a feeling of indescribable comfort experienced. Dr. Bennet states that he himself, when his pulse was 100 and skin hot and feverish, used to sponge in summer in the open air on the banks of a Scotch loch, the waters of which were at 60°, and derived therefrom the greatest benefit. (Dr. J. Henry Bennet, p. 77.)

Phthisis and Diseases of Debility.—Raw Meat and Brandy.—The author has been treating consumptive diseases in France by raw meat and brandy, and, he states, with wonderful success. It has now been tried in 2,000 cases, and in nearly all successfully. The patients soon begin to increase in weight. He also recommends the adoption of his treatment for the following maladies: advanced anæmia, the last stages of ague, typhus and typhoid, leucocythæmia, albuminuria, and diabetes, and also in cases where there has been great loss of blood or seminal fluid. (M. Fuster, p. 80.)

TRACHEOTOMY.—*A New Instrument for.*—Mr. Worthington, late house-surgeon to the Middlesex Hospital, has invented a deeply-grooved steel director, which is closely fitted to the back of the scalpel used in opening the trachea. It is left in the trachea when the scalpel is withdrawn, and serves to facilitate what often proves one of the most difficult steps in tracheotomy —the introduction of the canula into the trachea. (p. 250.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

ANAL FISTULA.—Pass, by means of a probe, a piece of stout thread or ligature through the fistula into the bowel, and bring the end out at the anus. Tie the two ends together loosely, and after a time tighten as necessary. The thread will ulcerate its way out, the parts in the rear healing as the thread advances. Sea-water injections used at the same time are of great use. (Dr. Andrew Paul, p. 136.)

CHOLERA.—*Camphor.*—Alcohol when 60° above proof will dissolve its own weight of camphor. This solution has been used by Dr. Rubini, of Naples, in 592 cases without a single death. The method of cure is as follows: When a man is seized with cholera, he should at once lie down, be well wrapped up in blankets, and take every five minutes four drops of the saturated tincture of camphor. In very severe cases the dose ought to be increased to from five to twenty drops every five minutes. In the case of a man of advanced age, accustomed to take wine and spirits, where the drug given in drops has no effect, give a small coffee-spoonful every five minutes, and in a very short time the coveted reaction will occur. Ordinarily, in two, three, or four hours abundant perspiration will come out, and then cure will follow.

The "preventive method" is this, let those who are in good health, while living in accordance with their usual habits, take every day five drops of the saturated spirits of camphor upon a small lump of sugar (water must never be used as a medium, or the camphor will become solid, and its curative properties cease), and repeat the dose three or four times a-day. Spices, aromatic herbs, coffee, tea, and spirituous liquors should be avoided. (Dr. Rubini, Mr. F. Smith, pp. 274, 275.)

Fifteen cases of cholera are reported at the Whitechapel Workhouse Infirmary which were treated with camphor dissolved in an equal weight of chloric æther. Fifteen drops of the solution were given on sugar in the first instance, and ten drops every quarter of an hour afterwards, according to the urgency of the symptoms. In about half the cases the extremities became warmer and lost their lividity, bile reappeared in the evacuations, and reaction took place. (Mr. Widdas, Mr. Richardson, pp. 273, 274.)

Nitrous Acid.—The diarrhœa premonitory of cholera may be speedily arrested by the administration of nitrous acid, and this suppression is never followed (in uncomplicated cases) by the very unmanageable consecutive fever which usually occurs when it has been effected by opium alone, or combined with the usual astringents. Moreover, in cases of collapse, when vomiting and purgation are at an end, it will cause reaction when no other remedy—not even castor-oil—will avail to do so. The best formula is a drachm of nitrous acid in eight ounces of water, of which a table-spoonful may be taken in a wine-glassful of water after every liquid stool. If there is also vomiting, it should be combined with gallic acid. (Dr. G. E. Nicholas, p. 272.)

Feeding by the Veins.—Dr. Richardson, of London, has invented a most beautiful and delicate instrument, by means of which patients may be fed by the veins with a solution of digested albumen. The use of this instrument in cholera is likely to be very great. The albumen is digested by exposure for a very long time to a low degree of heat—not sufficient to produce coagulation. (Dr. B. W. Richardson, p. 215.)

GALL-STONES.—*Passage of.*—The inhalation of a few drops of chloroform may be of the greatest service in cases of obstruction of the ductus communis by a gall-stone, relaxing the muscular fibres of the duct, and allowing of the passage of the stone. Purgatives and opium would probably make such cases worse. (Dr. C. Kidd, p. 201.)

HEMORRHOIDS.—*Arsenic.*—It is now upwards of thirty years since Sir Charles Locock pointed out the value of arsenic in *atonic menorrhagia*, and Dr. Handfield Jones explains the results by the influence arsenic exerts in producing contraction of the blood-vessels. It is singular that arsenic exerts a wonderful power in cases of hemorrhoids with or from atony of the system. Doubtless it acts upon the enlarged hemorrhoidal vessels, although its application in the treatment of such diseased states is entirely novel. (Dr. T. Parvin, p. 132.)

HERNIA.—The old mode of treating hernia is now fortunately given up, and the safe and successful operation without opening the sac is more promptly resorted to, and with a considerable reduction in the mortality per cent., which was often as high as two deaths in three. Purgatives were administered by mouth and rectum, the lowering effects of bleeding, tartar emetic, and tobacco were, one or other, or all, judged necessary, and prolonged attempts at reduction by taxis were repeated from time to time. The great mortality was due to the combined influence of delay, of depression resulting from medicines, and of actual injury done to the intestine by the taxis. (Dr. M. H. Collis, p. 130.)

The Taxis.—It must be borne in mind, in employing the taxis in cases of hernia, that the object is not to return the bowel, but to empty it, to unload it, if possible, first of its gaseous contents, and then of its feculent. (Dr. M. H. Collis, p. 130.)

Femoral Hernia.—Gay's operation for the relief of strangulated femoral hernia is beautifully simple, and as safe as it is simple. Make an incision parallel to Poupart's ligament and just above the neck of the sac, towards

which the finger of the operator must be directed. The finger-nail must be used to pick up on the side of the sac every constricting fibre which intervenes between the surface and Gimbernat's ligament. In recent hernia there will generally be found one tolerably well-marked superficial constriction, firm enough to be taken for Gimbernat's ligament. This must be carefully divided with the hernia knife. When all fibres and bands are divided or ruptured, the true stricture is reached at Gimbernat's ligament; it lies wonderfully deep down, and it is to be remembered that the finger must be pushed on at right angles to the place of the external wound, not being suffered to pass in any degree upwards, else the stricture will be missed and the finger be lost in a region above and superficial to it. Once felt it cannot be mistaken; a touch of the knife divides it enough, a slight nick will do. Gentle compression, with one finger in the wound and the others outside upon the sac, will empty the latter, and complete the reduction. (Dr. M. H. Collis, p. 131.)

Inguinal Hernia.—A case is related in which the author succeeded in curing a case of reducible inguinal hernia by a new method of operation. The internal spermatic fascia or fascia propriâ of the hernia having been exposed by incisions at right angles to Poupart's ligament, an aneurism needle was carefully insinuated through the areolar tissue of the lower and deeper part of this fascia, and by its means a ligature was placed between the sac of the hernia and the important structures of the spermatic cord, and carried through the upper and deeper part of the fascia. The fascia and sac were then drawn gently downwards and towards the median line of the body, and the ligature was tied tightly as high up and as far outwards as possible; in fact, as nearly as could be judged, exactly at the internal or deep ring. The ligature thus included the greater part of the circumference of the fascia propriâ or internal spermatic fascia just where it becomes continuous with the fascia transversalis, the whole circumference of the sac just at its junction with the general peritoneal lining of the abdominal parietes, and within the sac a small plug-like portion of omentum. (Mr. A. E. Durham, p. 129.)

A simple method of curing reducible inguinal hernia consists in sewing the columns of the inguinal ring together, subcutaneously, by silver wire, and leaving the wire permanently in the tissues, so as to act the part of a permanent internal clamp. The only instrument needed is a stiff needle, five inches in length, very slightly curved towards its point, near which is placed the eye. The other extremity of the needle is secured in a firm handle, which enables the surgeon to control its movements. (Dr. J. J. Chisolm, p. 127–129.)

Hydatids of the Liver.—*Injection of Extract of Male-Fern.*—A case is recorded at Guy's Hospital in which a large fluctuating deep-seated tumour existed on the right side, which was diagnosed as hydatid tumour of the liver. About four ounces of a limpid colourless fluid were allowed to escape through a fine canula, which, with a trochar, was introduced into the swelling. A liquid, consisting of half a drachm (by measure) of the purified semi-fluid extract of male-fern, half a drachm of liquor potassæ, and six drachms of water, was then injected into the sac, care being taken throughout to prevent the admission of air. The affection was permanently cured by this treatment. (Dr. F. W. Pavy, pp. 89, 90.)

AFFECTIONS OF THE URINARY ORGANS.

Diabetes.—Diabetics do better on a natural than upon a restricted diet, saccharine and amylaceous food being as necessary to their comfort and well-being as to that of persons in health. The circulation of sugar in the blood is not productive of bad symptoms either immediately or remotely, and the tendency to it is not decreased by "diabetic diet," however long persevered in, for the ingestion of amylaceous matter is always followed by a discharge of sugar from the system. (Dr. G. Owen Rees, p. 92.)

The system of dieting in cases of diabetes, especially in patients advanced in life, is not always required to be permanently persisted in. It often, and indeed in old people generally, happens that the healthy state becomes there-

by so restored, that an ordinary diet can be taken without any appearance of sugar, or only a little, in the urine. This, however, only happens after perseverance for a few months or a year. Dr. Pavy, whose observations the above are, has lately seen a case in a lady sixty-five years of age, where the sugar disappeared from the urine in a week, whereas, previously to following the restricted diet prescribed for her, she had been passing forty-eight grains of sugar to the ounce. (Dr. F. W. Pavy, p. 95.)

Bran Biscuits in Diabetes.—The bran biscuits so much used in diabetes contain 28 per cent. of starch—this renders their employment quite nugatory. The bran should be prepared by steeping in water, to which a little sulphuric acid is added, which will convert all the starch into glucose or grape sugar; this may be washed away and the bran thus rendered quite free from starch. (Dr. A. Hill Hassall, p. 96.)

DISTENDED BLADDER.—*To feel per Rectum.*—In cases of great distention of the bladder, you cannot always feel it above the prostate per rectum. It is a singular fact that the fuller the bladder the less you can generally feel it by the rectum. You can, however, always succeed by pressing the bladder down from the front of the abdomen into the pelvis with one hand, the finger of the other being placed at the same time within the rectum. (Mr. J. Hilton, p. 150.)

LITHOTRITY.—*Instrument for the removal of fragments of Calculus after.*—This instrument consists of a large silver catheter, having an oval opening on the convex surface. Within the straight part of the tube works a piston, by the partial withdrawal of which the sedimentary matter is sucked into the oval opening. Attached to the extremity of the piston-rod is a piece of watch-spring which ends in a small scoop, and three other small scoops or catches are situated on the spring nearer the piston. As the piston-rod is further withdrawn, these catches remove from the interior of the tube the particles of stone sucked into the opening by the piston. (Mr. J. Wood, p. 157.)

PAROXYSMAL HÆMATURIA.—Cases occasionally occur in which the urine usually is quite free from albumen, and natural in every way, but at certain irregular intervals, and always following exposure to cold, it contains a large amount of albumen, and sometimes blood globules. When the hands and feet get chilled, the patient is seized with shivering, and begins immediately to pass urine more or less dark coloured from the presence of blood. It may be assumed that in these cases there is no organic disease of the kidneys, as the urine between the attacks is quite healthy. The explanation must be, that in these cases the circulation in the kidneys is affected by the exposure to cold, just as under similar circumstances one person would have coryza, another bronchitis, another muco-enteritis. There are varying degrees of susceptibility to cold appertaining to different parts of different individuals. The principle to be acted on in the treatment is first of all, by suitable coverings or clothing, to diminish the risk of the patient getting chilled, and next to fortify the system by tonics and render it less impressionable by a narcotic. (Dr. F. W. Pavy, p 90.)

RETENTION OF URINE FROM DRINKING.—In a case of retention of urine from stricture spasmodically contracted from drinking, seat the patient over a shower of hot poppy-head decoction, which may be forced in spray by a suitable douche. In a variable time (twenty minutes in a case related) the bladder will be emptied almost involuntarily, and the use of the catheter rendered unnecessary. (Dr. Andrew Paul, p. 133.)

STRICTURE OF THE URETHRA.—In the ordinary plans of treating stricture of the urethra, we distend the narrowed part to the same size as the external meatus, whereas that portion of the urethra which is most frequently affected by stricture possesses in its natural condition a calibre at least double that of the external meatus. We ought to distend the strictured portion to at least twice the size of the meatus, and to apply the distending force to the strictured portion alone. This can be accomplished with ease by means of Mr. Thompson's instrument. This instrument is composed of two parallel rods, which can be slowly separated by means of a screw in the handle, through the action of two levers which exist between them.

When opened, the two blades produce the figure of a very elongated spindle, the centre of which corresponds with the site of the stricture. The instrument having been inserted, from seven to ten minutes must be occupied in slowly distending the part, the principle being to over-distend as much as possible and to rupture as little as possible. For an old and non-dilatable stricture within two or three inches of the meatus, internal urethrotomy should be preferred. If the urethra is narrowed at several points, Mr. Holt's plan is to be preferred, as more certain to hit all the points of narrowing. Mr. Thompson considers his own plan only suitable for those strictures, forming a large majority, which exist at from four to six inches from the meatus, and employs it only in the most intractable cases, preferring always to employ ordinary dilatation (usually by tying in the gum catheter) when it is possible to accomplish his object by this simple process. (Mr. Henry Thompson, p. 144.)

The ordinary plan of operating in cases of impermeable stricture—viz., by effecting a union between the two permeable portions of the urethra, by cutting down upon and dividing the intermediate strictured or obstructed portion—is most unsatisfactory, being frequently not only unsuccessful, but dangerous. Mr. Cock, of Guy's Hospital, says, "I have frequently seen this operation performed, or rather attempted; and I doubt whether in any one instance the original intentions of the surgeon were carried out." When a passage has really been established by the wound healing over the catheter, the canal which is formed is only a factitious one and begins to contract as soon as the use of the instrument is abandoned. Mr. Cock considers a preferable operation to be that of tapping the urethra at the apex of the prostate. The only instruments required are a *broad* double-edged knife, with a very sharp point; a large silver probe-pointed director, with a handle; and a canula, or a female catheter, modified, so that it can be retained in the bladder. The patient being placed in the lithotomy position, and the left forefinger of the operator being lodged, through the rectum, on the apex of the gland, let the knife be plunged steadily, but boldly, into the median line of the perineum, half an inch in front of the anus, and carried on to the apex of the prostate. It is of the utmost importance that during the operation the knife be not removed from the wound, and that no deviation be made from its original direction until the urethra is opened. The external wound should be prolonged a little upwards by a vertical motion of the knife, so as to be wider than the internal apex of the wound. A canula must be left in the wound and secured there by four pieces of tape. By this plan immediate relief is obtained, and the sinuses in the perineum are allowed to heal. The surgeon will, after a time, often be agreeably surprised to find that the sound passes readily through the old stricture, and that by proper treatment its calibre may be restored. (Mr. E. Cock, p. 152.)

New Dilator.—Dr. Aspray, of London, describes his new instrument for the cure of stricture of the urethra as combining the safety of the gradual method with the quickness of action and speedy cure of the rapid dilatation principle. (It is figured at page 142.) A No. 1 catheter is first passed into the bladder, and serves as a guide to a dilator which is passed over it to the stricture. The dilator terminates in a conical screw which is screwed through the narrowed portion of the urethra. The dilator is then withdrawn, and a bougie a little smaller than the dilator passed in its stead over the guide and allowed to remain. In many cases, however, the bougie is not required. (Dr. C. O. Aspray, p. 141.)

AMPUTATIONS, FRACTURES, DISLOCATIONS, &c.

AMPUTATION ABOUT THE FOOT AND ANKLE.—In operations of the foot for removal of diseased bone, it is the usual plan to remove bones at their articulations instead of simply removing the diseased portions; for instance, if the anterior surface of the scaphoid is diseased, the whole bone would be removed, whereas the removal of a slice off the front would suffice. Where

practicable, we should cut through the tarsal bones with a saw in preference to disarticulating them, and a rule should be followed of avoiding the destruction of joints whenever we can do so. (Mr. H. Hancock, p. 101.)

When it is necessary to remove any of the anterior portion of the foot more forward than Chopart's operation, it is well to ignore the joints, and to saw through the bones at the point of election. The foot is an aggregation of several parts, each perfect in itself, and of too great value to be destroyed without a cause. (Mr. H. Hancock, p. 100.)

Subastragaloid Amputation.—Malgaigne's method of operating (or more correctly M. Lignerolles') in cases where it is necessary to remove the foot, possesses advantages which cannot be claimed either for amputation at the ankle-joint, for Syme's, or for Pirogoff's operation. The plan is to remove the os calcis with the foot, and to leave the astragalus *in situ*, whereby a broad, firm, flat surface is obtained at the end of the stump, covered with natural heel structure. The removal of the projecting malleoli, as in amputation at the ankle-joint, is avoided. The flaps must be made from the sides of the foot, and be reflected towards the malleoli before the foot is disarticulated. The dorsal incision must be made over the medio-tarsal joint, instead of being carried in front of the ankle-joint. By this the sheaths of the extensor tendons are left undisturbed, and the risk of suppuration in the course of the tendons is materially diminished. The length of limb is equal to that given by Pirogoff's operation, but whereas in the latter this increased length of limb is obtained by a piece of bone transplanted, so to speak, to new ground, to an abnormal situation, the former supplies it by a non-disturbance of parts, by the preservation, in fact, of the astragalus in its natural position. (Mr. H. Hancock, p. 109.)

There is a modification of subastragaloid amputation by which in some cases the length of the limb may be still further increased. It is a modification of Pirogoff's. Leave the ankle-joint intact, and remove the head and under surface of the astragalus, and the whole of the os calcis with the exception of the posterior third. This posterior portion should be adapted by its cut surface to the under surface of the astragalus. (Mr. H. Hancock, p. 114.)

Caries of the Vertebræ.—In caries of the dorsal vertebræ, allow the patient to assume that position which is most comfortable, namely, the semi-flexed position; a water-bed will be required. This position favours that coalition of the bones whereby alone a cure can result. (Dr. J. Adams, p. 137.)

Club-Foot cured without Tenotomy.—The ordinary cause of deformity of the foot is not contraction of certain tendons, but paralysis of the muscles connected with the uncontracted ones. Hence division of tendons which retain their normal power is not the way to cure the deformity. The author's mode of treatment is to supply the place of the paralysed muscles by means of elastic cords. By a light and simple contrivance, these cords are fastened to points as near the origin and insertion of the paralysed muscles as possible, and the patient is encouraged to use his limb, while at the same time constitutional remedies are prescribed, and local means, such as friction, galvanism, &c., are employed. This treatment proceeds on the principle that our aim ought to be to strengthen weak parts, and not to weaken strong ones. The author has adapted his method to the treatment of knock-knees and crooked shins, and he has devised means by which spring force may be brought to bear upon these deformities in such a way as to draw the bones into a more natural position. (Mr. R. Barwell, p. 124.)

Dislocation at the Shoulder-Joint.—Dislocation at the shoulder may be very conveniently reduced by causing the patient to mount to a convenient height on some "steps," placing his arms across the top step, upon which is placed a pillow. The top step acts as fulcrum, and the weight of the patient's body answers to a great extent as counter-extension. (Dr. G. Hamilton, p. 122.)

Dislocation of the Hip and Shoulder.—Reduction by Manipulation.—The most important condition to be ensured for reducing dislocation of the hip is

a relaxed, but not perfectly helpless, flaccid, uncontractile condition of the muscles. At the first commencement of manipulation, particularly in cases of recent date, the movements made with the limb should be very gentle, not rough, nor abrupt. After flexing the limb well, it should be suddenly and rapidly, but not violently, rotated on its axis, and completely abducted, or adducted, as the case requires, and at the same time depressed or raised, when the adjuvant muscles will be perceived to rapidly contract. A snap is commonly but not invariably heard, and the reduction is accomplished. Of anæsthetics, the Dutch liquid (chloride of olifiant gas) or the bromide of ethyl are preferable to chloroform, as they have less tendency to induce muscular contraction and that violent struggling which chloroform so commonly induces before the system is brought fully under its influence. (Mr. T. Nunneley, p. 120.)

ENLARGED BURSA OF THE PATELLA.—Puncture the bursa with a lancet, and, after carefully expressing all the contents, apply firm pressure by a pad of lint, strapping, and bandage, so that its walls may be everywhere kept in contact, and its cavity obliterated. The case is generally cured at once and permanently, but the bursa may refill. In this event the same process must be repeated, and it is sure to succeed in the end. Even if repetition is necessary, a cure will be procured more easily, surely, and quickly than by any of the ordinary plans of treatment. (Mr. W. S. Savory, p. 125.)

FRACTURES.—*Liquid Glass Bandages.*—Liquid glass is silicate of potash, which is soluble in hot water, but insoluble in cold. The solution, applied by means of a brush over the ordinary bandages, rapidly hardens, and gives all the advantage of plaster of Paris or starch, with the advantage of being lighter and more cleanly. It is readily removable by means of hot water. (Prof. Schuh, p. 202.)

Fractures of the Spine.—Trephining.—The operation of trephining in cases of fracture of the spine is perfectly practicable, and may in some cases be of use. An incision from four to five or six inches long must be made through the integuments over the spine, with a strong scalpel, and by means of a strong curved bistoury the muscles must be divided on each side of the spinous processes, and a retractor with a broad flange inserted at each side. The operator should next feel in the sulcus, on each side of the spinous process, for the inequality caused by the injury, and by grasping successively each spinous process, in a pair of necrosis forceps, ascertain whether the posterior portions of any vertebra are broken. In the lumbar and lower dorsal region the division of any laminæ is extremely difficult—it is accomplished by strong forceps bent at an angle, something like the forceps known as "Fergusson's side cutting forceps." Experience shows that the laminæ may be cut through without fear of injuring the cord or its membranes. In the cervical region the removal of the bone can be effected with great facility by the gouge-forceps alone, the spinous process being first removed by the same instrument. (Dr. R. M'Donnell, p. 118.)

KNEE-JOINT DISEASE IN THE UPPER CLASSES.—Three-fourths of all knee cases in the upper classes of society are not cases of inflammation, though they appear so. There is no organic disease whatever in the joint. They are cases of local pain, originating in impaired health. The patient walks lame, the joint is stiff, not that it will not bend, but the movement is painful. There may be some increased heat in the joint when compared with that of the opposite limb, but not much in degree. The knee is slightly swollen. After the application of blisters, leeches, iodine, and other similar things useful in inflammatory affections, but injurious in these cases, the swelling of the joint will be palpable; the outline will have undergone a change. Months will pass in this way, the joint being neither stiffer, hotter, nor more swollen than it was in the earlier part of the case. Thoroughly nutritious diet, wine, bark, iron, sea-air, and change of scene, are the real remedies in such a case. (Sir B. Brodie, Mr. F. C. Skey, p. 58.)

AFFECTIONS OF THE SKIN, &c.

ECZEMA OF THE SCALP.—Paint the scalp occasionally with strong tincture of iodine, made with methylated spirit, at the same time keeping the hair cut short by repeated use of the scissors. The general health must not be neglected, cod-liver oil being given if possible. (Dr. T. W. Belcher, p. 158.)

INFLAMMATION AND ABSCESS.—It is a prevailing error to refer all examples of redness of vessels to inflammation. No term can be more inappropriate. The ancient definition of inflammation is founded on truth, but in the too frequent employment of the name we forget the conditions essential to it. Inflammation and abscess often result, as is so frequently seen in abscess in the breast after labour, from failure of nervous power and consequent unhealthy tone of the capillary system. There are two agents in addition to good nourishment especially applicable to the treatment of cases of this nature—bark and wine. In all cases of abscess, bark is invaluable. It promotes suppuration when already inevitable, and it checks suppuration in chronic abscess. It promotes appetite, and gives vigour to the system beyond any known tonic. (Mr. F. C. Skey, p. 160.)

MEASLES.—*Thermometry in.*—In measles, the range of temperature is a short and rapid one, thus contrasting well with typhus fever, for which this disease is apt to be mistaken. It rises to its highest point about the fourth, fifth, or sixth day, and then sinking rapidly it falls to the temperature of health about the seventh or eighth. Thus after the sixth day at any rate its course is diametrically opposite to that of typhus. (Dr. J. S. Warter, pp. 18, 19.)

SCABIES.—*Paraffine.*—Wash the parts well with a strong warm solution of common soda, and after drying apply paraffine very freely. A few repetitions will generally cure the case. (p. 160.)

VACCINE LYMPH.—*Dilution with Glycerine.*—Vaccine lymph may be dilated with glycerine to a considerable extent without impairing its utility. While augmenting the vaccinating material ten or twenty fold, the pustules which result differ in nothing from those produced by pure lymph. (Dr. Müller, p. 163.)

VENEREAL AFFECTIONS.

COPAIBA.—*To deprive of its Disagreeable Smell.*—Copaiba and pitch, of each one ounce; magnesia, a sufficient quantity to make a mass. According to the amount of magnesia, the mass will be more or less consistent. If the latter, a teaspoonful may be given two or three times a-day; if the former, pills may be made. M. Beyran, of Paris, has found this effectual to prevent the usual very offensive odour of the copaiba. (p. 171.)

GLEET.—*The Endoscope.*—The endoscope continues to be used in cases of urethral disease. It is especially useful in cases of gleet. The part of the mucous membrane affected may be seen distinctly, and a solution of nitrate of silver applied with very beneficial results. (Mr. C. Heath, p. 139.)

GONORRHŒA.—Never allow the patient to put a piece of lint or cotton-wool upon the mouth of the urethra to prevent the escape of the discharge, by which plan no doubt the shirt is kept clean, but the retention of the gonorrhœal fluid within the urethra ensures not only the intensification but the extension backwards of the inflammatory condition. (Mr. J. Hilton, p. 148.)

Oil of Erigeron.—The oil of erigeron is a volatile oil obtained from the E. Canadense, or Canadian fleabane, a plant officinal in the U. S. Pharmacopœia. It is a remedy of great value in gonorrhœa. It arrests the discharge in about seventy-two hours, and effects a cure in from six to eight days. If the urethral inflammation is severe, it is well to precede the remedy with a full dose of some active hydragogue, as jalap and senna. When this has operated, give ten drops of the oil on sugar, and three hours later a full dose of spts. æther. nit. in infus. althea, and so on every three hours alter-

nately, until the urethral irritation is allayed. Then leave off the latter and continue the oil until the cure is completed. (Dr. J. S. Prettyman, pp. 169, 170.)

Oil of Yellow Sandal Wood.—Oil of yellow sandal wood may be considered almost a specific for gonorrhœa and gleet, it may be used in any stage of gonorrhœa. It is unfortunately very expensive. The following are the best formulæ:—℞. Olei santal. flav., ʒiij.; ess. cinnamomi ʒj.; spt. rect. ad ℥ ij. Misce. Dose, a tea-spoonful three times a day, in a wine-glassful of water after food. ℞. Olei santal. flav., ℥i.; olei sabinæ, ʒj.; ol. cubebæ, ℥ss.; ol. copaibæ, ℥j.; ess. cinnamomi ʒj.; spt. rectif. ad ʒvi. Misce. Dose, same as preceding. (Dr. H. S. Purdon, p. 170.)

AFFECTIONS OF THE EYE.

Lacrymal Disease.—*Removal of the Lacrymal Gland.*—It is frequently impossible to cure cases of lacrymal disease, even by Bowman's plan of dilatation. A much more satisfactory mode of treatment in some cases (not all) is the removal of the whole or a portion of the lacrymal gland. This can be readily accomplished from the palpebral surface of the lid. The incision must be made close below the eyebrow, at the upper and outer part of the orbit. It is a singular fact that the lacrymation is cured whether the gland is completely or only partially removed. The eye continues moist after the operation, quite as moist in fact as a healthy eye. (Mr. J. Z. Laurence, p. 165.)

Rheumatic Iritis.—In this, as in other forms of iritis, our chief aim should be to arrest inflammation, and so prevent effusion of lymph. Nothing answers so well as mercury, which is best administered in the form of calomel, combined with a quarter to half a grain of opium to each dose. Even when lymph has been effused and is becoming slowly consolidated, the administration of mercury will cause its absorption, provided it is given for a sufficient length of time. In persons, however, of broken-down health or phthisical tendencies, a combination of two grains of quinine, three of blue-pill, and three of extract of hyoscyamus is more beneficial. Atropine is a useful auxiliary, but cannot supplant the use of other means of treatment. (Mr. J. Rouse, p. 167.)

MIDWIFERY, &c.

Abortions.—"*Retained Placenta*" *in.*—It is quite unnecessary to meddle with the placenta after the fœtus has come away prematurely. It is often retained for many hours, and if the patient is plugged, she may safely be left to nature. On removing the plug in ten or twelve hours, the placenta will come away with it. (Dr. C. B. Suckling, p. 177.)

Cancer of Uterus and other Parts.—*Application of a Spirituous Solution of Bromine.*—Dr. Wynn Williams, of the Samaritan Hospital, London, for some time has been using a spirituous solution of bromine as an application to any cancerous growth where there is a breach of surface. The bromine and spirit must be mixed very gradually for fear of an explosion. It has been chiefly tried in cases of cancer of the uterus, and two cases of this kind are related by Dr. Routh, both of which were cured. In one case, a large cauliflower excrescence was removed by the *écraseur*, and a few days afterwards the solution of bromine was applied. She took internally the iodide of arsenic and extract of conium. The report states that she left the hospital with a movable uterus covered with healthy mucous membrane, and looking herself fat and hearty. The beneficial effects of bromine are not confined to its escharotic action only, but it acts also as a powerful disinfectant. (Dr. C. H. F. Routh, Dr. W. Williams, Dr. Rogers, pp. 196, 197.)

Compound Anæsthetics in Midwifery.—There can be no doubt that the administration of chloroform in labour is attended with two great drawbacks, viz., the danger of an overdose, and the retarding effect upon the

pains. These are completely avoided by the use of mixed ether, chloroform, and alcohol vapours, which act as a gentle stimulus rather than as a sedative to the labour pains. Mr. Ellis has invented an instrument which is self-supplying with an amount of these vapours, which may be regulated both absolutely and relatively. It may be obtained from Messrs. Savory and Moore. (Mr. R. Ellis, p. 175.)

Division of the Cervix Uteri in Dysmenorrhœa.—Dr. Tilt deprecates the extreme surgical tendency that seems to characterise the present epoch. The utility of dividing the cervix uteri has been much exaggerated. There is so great a tendency on the part of the divided surfaces of the cervix to unite that the operation is generally useless unless followed by dilatation. Dilatation alone is in most cases the safest and best way to relieve dysmenorrhœa and to facilitate conception. Division of the cervix should be restricted to cases where the cervical canal is extremely narrow, or the cervical walls very hard, and to cases wherein dilatation has proved a failure, or where there is flooding from uterine fibroids. (Dr. E. J. Tilt, pp. 192, 193.)

Dr. Henry Bennet states that twenty years ago, at Sir James Simpson's instigation, he operated in many cases of narrowed or strictured os uteri, producing symptoms of dysmenorrhœa or sterility. Owing to the frequent relapses, he has long since abandoned this practice, and dilates with very small sponges. Dr. Bennet has never once had an accident with the use of sponges. It is very important not to attempt dilatation if the tissues are at all inflamed. (p. 194.)

It must be remembered that a sphincter muscle exists at the os internum, the circular fibres of which contract immediately the cold uterine sound reaches them, and impede its entrance into the bladder, and a stricture is declared to exist. (Dr. Henry Bennet, p. 194.)

Hysterical Pain.—Hysterical pain is confined to the skin and is always made worse by pinching it up. This is very useful in distinguishing the pain of pleurisy from that hysterical pain which is so common under the mamma. (Dr. C. B. Garrett, p. 197.)

Iodized Cotton in Female Affections.—Iodized cotton is made as follows: Two ounces of iodide of potassium and one ounce of iodine are dissolved in eight ounces of glycerine, in which solution eight ounces of cotton wool are thoroughly saturated and then carefully dried. A piece of this iodized cotton is most useful as an application to the os uteri in cases of subinvolution with or without congestion or induration of tissue, in cases of chronic inflammatory enlargements and thickenings of the cervix uteri; in cases of pruritus apparently due to acrid secretion passing through the os uteri, and in cases of epithelial cancer of the neck of the uterus. It must be passed up by means of a speculum and pressed firmly against the cervix uteri, over which a piece of cotton wool similarly secured, somewhat larger, and freely saturated in glycerine, should be placed and retained *in situ*, while the speculum is being withdrawn. It may be applied twice or three times a week, each time being withdrawn by means of a thread tied round the middle. (Dr. R. Greenhalgh, p. 259.)

Ovarian Dropsy.—The filling of an ovarian cyst is not the result of mere osmosis, but must be due to the activity of cells on its inner surface, whilst the extension and strengthening of the walls follow. It is probable, were the contents of an ovarian cyst rendered decidedly acid by the injection of dilute acetic acid, that, as in the case of cancer cells, the structure and vitality of the cell lining would be destroyed and their growth arrested, a result which would be followed by resorption of the fluid and shrinking of the walls. (Dr. W. H. Broadbent, p. 262.)

Dr. Junker considers that the injection of acetic acid into an ovarian cyst would prove very dangerous, as the cyst wall becomes quite rotten when the experiment is tried out of the body. (Dr. F. E. Junker, p. 263.)

Ovariotomy.—*Treatment of the Pedicle.*—It is well to saturate the piece of pedicle which is strangulated by the clamp with perchloride of iron. By this means the part is tanned as it were, and becomes as hard and dry as a piece of leather, and does not cause suppuration about the wound. The use

of the clamp is preferable to the plan of leaving the pedicle in the abdominal cavity, for vent is given to a little menstrual fluid every month for two or three times, and this would otherwise enter the abdominal cavity. The clamp is not, however, appropriate in all cases. In some it may be desirable to tie the vessels and leave a short pedicle in the abdominal cavity. It does not prove a successful plan to leave the ligatures long and hanging out of the wound, for they seem to set up inflammation. Silk should be used and cut off short. Silk is preferable to wire, for it is an animal substance, and experiment proves that it may be absorbed. (Mr. T. Spencer Wells, p. 187.)

New Clamp.—A new clamp has been designed by Mr. Chambers, of the London Surgical Home. It consists of two parallel blades, held together by two racks. In these racks a pinion works, which is moved by the handle. The blades can be connected or disconnected at will, by simply pulling a trigger. It is very simple, and can be applied and removed with great facility. The sides being parallel, this clamp can receive and completely compress a larger pedicle than any other instrument of the kind. It may be obtained from Messrs. Mayer and Co., of Great Portland-street, London. (Mr. T. Chambers, p. 190.)

Application of the Actual Cautery to the Pedicle.—It is preferable in all cases first to apply the actual cautery to the divided pedicle. Should this fail in completely arresting hemorrhage, no harm has been done and the ligature may be resorted to without disadvantage. But it is decidedly better to do without ligatures if possible. (Mr. I. B. Brown, p. 189.)

The use of the clamp is now being abandoned in London, by many surgeons, and the division of the pedicle by the actual cautery substituted. The mode of proceeding is to squeeze the pedicle pretty firmly by the clamp and then to divide it by the actual cautery run along it slowly, close to the clamp. The clamp must be removed very slowly, and the cauterized surface be untouched by the finger. Sometimes, though rarely, ligatures must be used in addition; if so, they must be cut off close to the knot. (Mr. Philip Harper, *Lancet, Nov.* 24, 1866, p. 578.)

PREMATURE LABOUR.—*New Method of Inducing.*—The plan of simply separating the membranes from a zone or arc of the uterus around the os does not always induce uterine action, and it is an objectionable thing to leave the catheter in the uterus, as it necessitates the confinement of the patient to bed. Dr. Earle, of Birmingham, introduces, by means of a whalebone guide, a piece of India-rubber tube about two inches long, and closed and tapering somewhat at the upper end. This is left in the uterus, between the membranes and the uterine wall, until pains begin, when it may be removed by means of a piece of string attached to the lower end. Being soft and compressible, it is less likely to injure the uterus, or to rupture the membranes than the catheter is. The patient can walk about retaining this small foreign body without any risk. More than one tube may be passed into the uterus if desired. (Dr. Lumley Earle, p. 172.)

PUERPERAL CONVULSIONS.—*Chloroform.*—In cases of puerperal convulsions, whether we have albumen in the urine or not, the careful, skilful administration of chloroform, even before adoption of the lancet, seldom fails to afford marked relief, and in a majority of cases we may dispense with the excessive venesections of former times; chloroform in such cases, of course, is not to supersede other means usually had recourse to, such as delivery. (Dr. C. Kidd, p. 200.)

STEEL FILLET, A SUBSTITUTE FOR THE FORCEPS IN MIDWIFERY.—Mr. G. R. Sheraton (of Sedgefield, Durham) has invented a steel fillet which is intended to supersede the forceps, vectis, &c., in cases of difficult parturition where the use of these instruments is indicated. It consists of two blades of highly tempered and flexible steel, each nearly the shape of the ordinary forceps blade when viewed sideways. These blades are united by a linked joint at the extremities, and can rotate in their single handle so that they may either be separated to form a loop, or put close together to facilitate their introduction. It is as easy to introduce this instrument as it is to introduce a single blade of the forceps, and when introduced, the blades can

be made to diverge and enclose either the occiput or the chin of the fœtus. The narrowness, thinness, and flexibility of the blades render their application both easy and but little liable to injure the maternal passages or the fœtal head. This instrument can be used without the knowledge of the mother. From the facility with which it can be applied, the duration of the operation is shortened. (A wood-cut will be found at page 176.)

VAGINAL SPECULUM.—Dr. Emmet, of the Woman's Hospital, New York, has invented a vaginal speculum, whereby a larger portion of the vagina can be exposed than can be done by any other instrument in use. It will be best understood by reference to the wood-cut at page 180. This instrument does not require the aid of an assistant, as does Sims's speculum, and is much more suitable for long operations on the uterus or vagina. It gives no pain, from the fact that the perineum is compressed to one side of the coccyx. It is made by Ford and Co., of Fulton-street, New York. (p. 180.)

MISCELLANEA.

ACTUAL CAUTERISATION WITH CHARCOAL PENCILS.—Pencils may be made of charcoal, nitrate of potash, and a little gum tragacanth, which light and burn like a cigar, and are very useful as an actual cautery. A mass should be made and rolled into cylinders about four inches in length, and of the diameter of a common pencil. (M. Bretonneau, p. 250.)

CHLOROÆTHERINE.—Chloroætherine is prepared by mixing one part of rectified Eau de Cologne (i. e., Eau de Cologne distilled from rectified spirit) with two parts of chloroform. The result is a clear liquid of specific gravity 1·152. It may be used in cases of labour when it is wished to give something that will not produce unconsciousness but will obviate or lessen the pain of parturition. It may be used in numerous cases of tooth extraction, painful vaginal and other examinations, uterine and urethral stricture. In the latter it is extremely beneficial, as it at once allays the nervous spasm, often extreme, which is always induced at the approach of an instrument in such cases. (Mr. I. B. Brown, Jun., *British Medical Journal*, *July* 21, 1866, *p.* 88.)

EMPYÆMA.—*Drainage Tubes.*—An interesting case is recorded by Mr. Berkeley Hill, of University College Hospital, in which an empyæma was tapped and a straight pewter catheter introduced as a drainage tube. The advantage of this was that the position of the beak could be altered if the fluid stopped running. 34 oz. of putrid matter were got away the first day, and on the three next days respectively 31 oz., 21 oz., and 21 oz. The next tapping withdrew 16 oz. of pus, perfectly free from odour. The case is related to illustrate the great necessity of regularly withdrawing the fluid from the chest in all cases of empyæma; moreover, that tapping and closure of the orifice, or even leaving the fluid to drain away itself, is not sufficient. (*Lancet*, *Nov.* 24, 1866, *p.* 574.)

NARCEINE.—M. Linné, in some researches on the action of narceine published in the *Journal de Chimie Médicale*, states that that alkaloid is more powerfully narcotic than either morphia or codeia. It does not cause nausea, and has not any constipating effect on the bowels. It has the peculiar effect of suppressing the flow of urine. (p. 200.)

NATURAL QUININE (*or Quinoidin*).—In experimenting upon the absorption of quinine by the tissues and its elimination subsequently, Dr. Bence Jones has made the unexpected discovery, that a substance exists naturally in every tissue of the bodies both of man and animals undistinguished by chemical tests from quinine. It differs slightly from quinine in that its ray in the solar spectrum is a little more greenish. This substance may be separated from the tissues, but it has not yet been crystallized or obtained in sufficient quantity for analysis. A hopeful prospect of possible discovery arises from this as to the explanation of the cause and cure of ague. Assume that a substance like quinine exists, during health, in the textures, can its rapid destruction and removal through the action of marsh miasm give rise

to ague? (Dr. Bence Jones, *Medical Times and Gazette, Aug.* 18, 1866, *p.* 163.)

PSEUDO-MEMBRANOUS BRONCHITIS.—This is a very rare form of bronchitis in which the inflammation commences in the smaller tubes, and is attended with effusion of plastic lymph. The inflammation spreads upwards towards the trachea, instead of originating in it and passing downwards as in croup. Pathologically the disease denotes a peculiar modification, without necessarily great intensity, of the inflammatory process. The symptoms are cough and dyspnœa, with expectoration of false membrane at intervals varying greatly in different cases; days, weeks, months, and sometimes years intervening. The disease is generally rapid in its career, and highly dangerous, although the expectoration of false membrane may be followed by relief more or less complete. (Dr. Austin Flint *on the Respiratory Organs, p.* 337.)

PURIFICATION OF WATER CONTAINING OXIDIZABLE ORGANIC MATTER.—There are three ways of purifying water from oxidizable organic matter. The first is the admixture of permanganate of potash with the water so long as the colour of the permanganate is destroyed. The second is the use of animal charcoal filters or purifiers at the water-works. (The employment of this by a water company would be neither formidable nor expensive.) The third is the employment of Mr. Spencer's "magnetic carbide,"—a form of oxide of iron prepared by him. This substance is stated by him to cause the oxidation of all the organic matter in water without losing its power by use. It is equally applicable, we believe, to the filter-beds of a water-works and to the house-filterer. The action of this carbide of iron can be tested readily by means of a solution of permanganate of potash, and it will be found to act as well in a month as at first. In this material, then, lies a means of purifying water at a trifling cost at the water-works. (p. 270.)

Purification of Water by refuse Paraffine oil shale.—It appears that the solid refuse of shale used in the manufacture of paraffine oil is a most perfect purifier of the filthiest water. Some of it thrown into water highly contaminated by sewage rendered it perfectly clear and fit for drinking purposes. (*Lancet, Sep.* 29, 1866, *p.* 364.)

TOOTH CEMENT.—Prepare a light oxide of zinc by moistening the ordinary oxide with nitric acid, and then igniting it. Thus prepared, it is made into a soft paste with a solution of chloride of zinc, having a specific gravity of 1·9 or 2·0. This soft mass speedily acquires great hardness, which it permanently preserves. It may be coloured grey, if desired, with the least trace of carbon. (Herr Stehle, p. 207.)

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THE

RETROSPECT

OF

PRACTICAL MEDICINE AND SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M. D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.,

AND

JAMES BRAITHWAITE, M. D., LOND.

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PRACTICAL MEDICINE,

&c., &c.

DISEASES AFFECTING THE SYSTEM GENERALLY.

1.—ON THE DIARRHŒA OF ENTERIC OR TYPHOID FEVER.

By Dr. George Johnson, Physician to King's College Hospital.

[During a quarter of a century Dr. Johnson has seen two different and opposite plans of treating the diarrhœa of fever. The late Dr. Todd gave repeated doses of opiates and powerful astringents. When the stools were frequent it was a common practice to give an enema of starch with laudanum, twice, thrice, or even oftener, in the course of the day. This practice was not attended with satisfactory results.]

All this has been much changed during the last few years. There has been no change in the type of typhoid fever; the disease is, in every respect, the same as in former years. There is the same intestinal ulceration; but the intestinal symptoms are far less troublesome. There is much less of obstinate diarrhœa, much less of distressing tympanitis; and this amelioration of symptoms is coincident with a complete change of practice. I have described the former mode of treatment. Our practice now is, as a rule, to leave the diarrhœa alone, and rarely to give opiates or other astringents to check it. You will understand, of course, that I am speaking only of the practice in my own wards. It is a most unquestionable fact that, since the discontinuance of the opiate and astringent treatment, the diarrhœa and the other intestinal symptoms have been far less troublesome to the attendants, and far less distressing to the patients.

And it appears to me that the explanation of these different results is not difficult. In most cases of typhoid fever, there must be more or less of diarrhœa; for there is ulceration of the bowel, and, as a consequence of this, morbid secretions are poured out, which irritate the bowel and have to be expelled. This is obvious, without entering upon any theoretical considerations. If now, while this morbid process is going on in the intestines, repeated opiates are given, either by the mouth or by the rectum, the effect is certainly not to stop or to check the ulcerative process in the bowel, nor to prevent the pouring out of morbid secretions from the ulcerated surfaces; but to lessen the sensibility and the contractility of the bowel, and so to retain the morbid secretions until they decompose, give off offensive gases, and thus become a fresh source of irritation and distress. I attribute the unfavorable results of this practice mainly to the effect of the opiates in preventing or retarding the expulsion of the offensive secretions from the bowel.

Not long since some of you had the opportunity of seeing the effect of discontinuing the astringent treatment in the case of a young woman who was admitted at about the end of the second week of typhoid fever. She had been under the care of a friend and former pupil of my own, and he told us that she had been treated by logwood and laudanum every six hours, yet, in spite of this, the diarrhœa had been profuse and frequent up to the very time of her admission into Twining Ward. I directed her to be put upon the usual fever diet, and to have a dose of coloured water three times a day. The troublesome diarrhœa ceased immediately; the bowels acted only once

or twice a-day. She made a good recovery; and my friend frankly admitted that the "let-alone plan" had been much more successful than his opiate and astringent treatment.

In our endeavor to explain the undoubted fact, that the intestinal symptoms of typhoid fever are now much less troublesome than in past times, it is right to mention that in some other particulars our treatment has been modified. We now give much less medicine of every kind than we formerly did; and, in particular, we avoid the risk of irritating the bowels by repeated doses of mineral acids. We give alcoholic stimulants more sparingly and with more discrimination. As a rule, we give none during the early stages of the fever: when I am convinced that their indiscreet employment often increases febrile excitement, cerebral oppression, and gastro-intestinal irritation. In short, our chief reliance now in the treatment of this fever is upon rest in bed, with good nursing, judicious feeding, and stimulants when necessary. Our fever patients are fed mainly upon milk, beef-tea, eggs, and arrow-root.

If you refer to Trousseau's *Clinique Médicale* (tome i. p. 258), you will find that his practice, when the stools of typhoid fever are frequent and abundant, is to give saline purgatives—either sulphate of soda or a Seidlitz powder. This treatment he thinks especially indicated, when the diarrhœa is associated with much flatulent distention of the bowels, and in such cases he repeats the dose several times. If, after this, the diarrhœa continue, he gives what he calls absorbent powders—nitrate of bismuth in combination with chalk, and in some cases small doses of nitrate of silver—but he makes no mention of opium as a remedy in this class of cases.

When the intestines become much distended by a mixture of air and liquid, the relief which follows evacuation of the bowels is often great and permanent. This may sometimes be effected by a laxative enema, but in most cases more surely by a tablespoonful of castor oil combined with a few drops of laudanum in some aromatic water. In such cases, if we can get rid of irritating secretions by a mild evacuant, we are acting on the principle which should continually guide us in the treatment of typhoid fever; namely, to ensure as much as possible of rest for the diseased intestine. The intestines in these cases may be irritated by uncalled-for drugs, by injudicious feeding, by the untimely or excessive administration of alcoholic stimulants, by the accumulation of morbid secretions within the bowels, by muscular exertion on the part of the patient, or by rough pressure over the abdomen on the part of the practitioner. All these known sources of irritation and of injury ought, therefore, to be most carefully avoided.

In conclusion, let me say emphatically that, when peritonitis is threatened or actually present, whether the result of perforation of the bowel or of the ulcerative process extending deeply into the tissues, our main reliance is upon absolute rest, light hot fomentations over the abdomen, and opium in full and frequent doses. I have seen cases apparently the most desperate recover under this plan of treatment; one case in particular, that of a girl, eleven years of age, in whom all the symptoms of perforation of the bowel were present. In such a case, when recovery takes place, however sudden and severe may have been the onset of the peritoneal symptoms, it must of course remain doubtful whether perforation of the bowel had actually occurred.—*British Medical Journal*, *March* 16, 1867, *p.* 279.

2.—ON THE USE OF THE SULPHITE OF MAGNESIA IN THE TREATMENT OF ZYMOTIC DISEASES.

By H. R. De Ricci, Esq.

M. de Ricci thinks that the want of success which has sometimes been observed in the treatment of zymotic diseases by the alkaline and earthy sulphites, is attributable to the fact that these remedies have not been administered early enough. If the treatment is too long delayed, the blood becomes

so loaded with poison and deteriorated in quality as to be no longer able to perform its normal function, and then the sulphites are of no more service than any other remedies, because they cannot restore to life the dead blood-corpuscles. The sulphites should therefore be administered early, while still a large portion of the blood is in a healthy state, and capable not only of carrying on life, but of throwing off what has been rendered inert by the presence of the sulphuric acid. M. de Ricci attributes another source of failure to the administration of hyposulphite of soda, instead of the sulphites, and especially the sulphite of magnesia. The hyposulphite of soda is less efficacious than the sulphites, because in the former the greater part of the acid becomes oxidized in its passage through the animal economy, and appears in the urine as a sulphate, because, being a salt of hyposulphurous acid, it is a less active anti-zymotic; and because it often causes a troublesome diarrhœa, while the sulphites of soda and magnesia never produce such effects. M. de Ricci prefers the magnesian salt for internal administration, as it is less unpalatable, and contains a larger proportional quantity of acid than the soda salt; but he uses the sulphite of soda for external application, because, from its greater solubility, a stronger lotion may be made with it. The sulphites of potash, lime, and ammonia are also active anti-zymotics; but they are in no way superior to the salts of magnesia and soda, while their very noxious taste renders them objectionable. M. de Ricci relates some cases illustrating the efficacy of the sulphites, and he concludes his paper by predicting that eventually the treatment of zymotic diseases by the administration of the sulphites will be as fully recognized as that of ague by cinchona.—*British and Foreign Medico-Chirurgical Review, April*, 1867, *p.* 523.

3.—ON THE INTERNAL USE OF TARTAR EMETIC IN ACUTE INFLAMMATIONS.

By Dr. John Spender, Surgeon to the Eastern Dispensary, Bath.

[Dr. Spender was sent for, to see a lady whom he had attended in labour fifty-eight hours before. She had symptoms of acute inflammation in the left breast. Having gone through mentally all the most likely plans of treatment, he says:—]

In quiet despair I took up the fourth edition of Dr. Churchill on Diseases of Women, and on page 752 I found an apposite quotation from Dr. Beatty, who says, that, on the accession of inflammation in the breast, he has given one-sixteenth of a grain of tartar emetic every hour, with the result that in ordinary cases the pain and fever are mitigated, and the breasts are smaller and softer. He says that these doses may induce slight nausea, but never or very rarely free vomiting. Dr. Churchill ratifies Dr. Beatty's opinion by saying that tartar emetic, given in this form, has a more powerful effect in abating inflammation of the breast than any medicine he has ever tried.

Armed with this knowledge, but slightly sceptical as to its entire truth, I visited my patient, and discovered that acute lobular inflammation of the breast had set in, and was marked by all the usual symptoms. Fifteen drops of tartar emetic wine (one-sixteenth of a grain) were ordered to be given in half a wineglassful of water every hour through the night, until eleven o'clock the next morning, a period of exactly twelve hours. Nothing local was applied, except a piece of hot, wet flannel covered with oiled silk.

After twelve doses of this medicine, administered with unfailing punctuality, it is no exaggeration to say that the inflammatory hyperæmia was almost gone; the breast was only a little more swollen than the other, and there was scarcely any pain. It is pleasant to add, that there had been not only not the slightest vomiting, but even no appreciable nausea. Indeed, for any thing that appeared to the contrary (barring a trifling diaphoresis), the patient might have been taking so many rations of pure water. The medicine was given in the same quantity every two hours until the next day; then every four hours for another day; and in less than four days from the

beginning of the treatment, all signs of mammary inflammation had vanished.

On September 25th, I attended in a very rapid labour another lady, who recovered without a bad symptom, except that, on the fourth day after delivery, signs of inflammation of the left breast were suddenly developed. The chief characteristic of this patient is an extreme sensitiveness to pain, so that an ordinary neuralgia causes a quasi-delirium, requiring opium to subdue it, and to restore healthy function. In this case, therefore, on account both of the tendency to delirium and an irritability of bowels, I combined one drop of tincture of opium with fifteen drops of tartar emetic wine, and administered it in water every hour for fourteen hours. After five doses had been given, profuse diaphoresis occurred; coincident with this the pain suddenly went away, and sleep followed; and in three days from the time at which the treatment was begun, there was scarcely a relic of what had happened. Here, as in the first case, the doses of medicine were reduced in frequency by degrees, and no local means were used except the wet flannel and oiled silk.

Within the first week in October, a sempstress applied to me at the Eastern Dispensary, on account of a common whitlow of the thumb, in the very first stage of heat, swelling, and pain. The tartar emetic wine was given in the same doses, and with the same result of complete success.

A week afterwards, I was asked to see a domestic servant in a gentleman's family, with a whitlow of the index finger. She, too, had all the classical symptoms of whitlow (which, you may remember, Erichsen calls an erysipelatous disease), and she obediently took the tartar emetic medicine every two hours for a day and a night. So much better was she then, that she called herself "well"; but, alas for her prognosis! the result of her abandoning the medicine too soon was, that the disease returned, and ran the usual course of a whitlow, in spite of the medicine being diligently taken again, and in spite of every local means, scientific and empirical.

About the end of October, a married woman came to the Dispensary with threatening lobular inflammation of the right breast in the tenth month of lactation; the pathological sequel of over-nursing in a weak constitution. For three days she took the tartar emetic medicine (in the dose already specified) every three hours, and being well supplied with nutritious food, she seemed nearly well at the time of the next attendance. Here my own prognosis was at fault, for I rashly ventured to leave off the tartar emetic mixture, and substitute a ferruginous tonic; and a complete failure it was, for I had at last to deal with a chronic mammary abscess in its usual troublesome form.

In nearly all these cases, a mild aperient was the only other medicine given. If there had been time, I might have related other cases of external inflammation cured by precisely the same method.

On reviewing the histories just narrated, it is noticeable that the inflammation is of an external and visible kind, and that it has in it something of a pyæmic or erysipelatous quality. These two circumstances seem to be the chief factors on the part of the patient. On the side of the remedy, we observe that it is administered in very frequent and minute doses, and that its successful therapeutic effect can be produced without the physiological discomforts of the slightest vomiting or nausea.

First, then, as to the nature and extent of the inflammation; it is familiar to everyone how antimony can abate and utterly abolish inflammation of the viscera and of mucous membranes by its depressing and shock-like power—acting distinctly on the nervous system. We seek to illustrate this power by the old antiphlogistic terminology—or, as Pereira expresses it, tartar emetic is useful in inflammation and fever by its contrastimulant, sedative, and sudorific influence. I have spoken in this paper, however, solely of external inflammations, for as yet I have made no inquiry into the effects of minute and frequent doses of tartar emetic in the internal inflammations.

Note, then, that tartar emetic, given in the dose of one-sixteenth of a grain every hour at the very outset of a cutaneous inflammation, may control and cure that inflammation with its attendant pyrexia. How does it do so? The

action of this medicine has been well expounded by Dr. Billing and Dr. Headland. Dr. Headland lays emphasis on its neurotic influence; and Dr. Billing has entered largely into the subject, and with a certain boldness of language, speaks of the tonic properties of antimony and calomel. That is to say, the capillary blood-vessels, being distended in normal inflammation by the stasis of their contained blood, are reduced in size by the action of antimony on the vaso-motor nerves—the blood is propelled onwards—exudation is checked—and heat, pain, redness, and swelling go away. In brief, the inflammation is summarily put an end to, and that not by any weakening of the nerves of the capillaries, but by endowing them with more life. Any substance which does this must be described as an instrument of tone and power.

I believe that the influence of medicines given in very small and very frequent doses has not been sufficiently studied. I have long been engaged in investigating this subject, especially with reference to opium. There are many and obvious hindrances, such as the trouble imposed on the attendants, the difficulty of testing regularity of administration, and the possibility of dangerous accumulation in the system; but the advantages are often enormous—and sometimes only in this way can we gather all the good out of a medicine without any of its harm.

Studying the action of tartar emetic in an enlarged manner, and with special reference to the physiology of inflammation, we can make no claim to its having particular control over inflammation of the breast more than inflammation elsewhere, as some obstetric authors have imagined. It cures inflammation, as we see it on the outside of the body, by an orderly sequence of phenomena, by its toning power on the vaso-motor nerves, by the return of the capillary blood-vessels to a healthy size, and by absorption of the inflammatory effusion. The occurrence of suppuration is a signal that the remedy can be of no use. There need be no nausea and no vomiting, and nothing beyond a general diaphoresis and possibly diuresis. And the rest of the treatment consists in the application of common sense to every emergency that may arise.—*British Medical Journal, March* 23, 1867, *p.* 313.

4.—THE COMPARATIVE VALUE OF DISINFECTANTS.

Dr. LETHEBY has supplied the Registrar-General with a detailed statement of his practice as health officer for the City of London, in regard to the several disinfectants used by him for the various purposes required. Dr. Letheby prefers chlorine and chloride of lime for the disinfection of sick rooms; carbolate of lime and carbolic acid for drains, middens, and sewers; carbolic acid, chloride of zinc, or chloride of iron, for evacuations; for stables and slaughter-houses, a mixed chloride and hypochlorite of zinc, which freely amalgamates with the liquid matters of the slaughter-house without imparting unpleasant odours to the meat.—*Lancet, Dec.* 1, 1866, *p.* 651.

5.—ON THE TREATMENT OF PRIMARY CANCER.

By CHARLES W. MOORE, Esq., Surgeon to the Middlesex and to St. Luke's Hospitals.

[Speaking of the injection of cancers with acetic acid, the writer continues in the latter half of his paper:]

It is not yet possible to foresee the extension of which that method of treating cancer is capable. I have myself much hope from the employment of it; but I am already satisfied by its effects in secondary tumours, that it is not yet made applicable to the primary. From the first promulgation of this treatment by Dr. Broadbent, I have never used it or advised it in any case for which the ordinary operation was adapted, as it did not appear

right to essay a remedy so little tried, and the adequacy of which for relieving all conditions of the disease was uncertain, in any person entitled to treatment known to be effectual. Already I have come to know that both disappointment and damage have resulted from an experimental use of the acetic acid in cases of primary cancer of the breast, which were fitted for removal by the knife. It is the more incumbent on me to say this, as by announcing the destruction of cancerous matter in the interior of a lymphatic gland with this acid, and the absolute dispersion of small recurrent subcutaneous cancerous tumours by the same means, I may unwittingly have encouraged others to what I cannot but think a misapplication of the remedy. So ready a method of disposing of cancer is not yet won. Its unseen diffusion beyond the apparent limits of a tumour, is too certain a fact to justify confidence in injections for the removal of it. Neither is it to be yet expected of a remedy so slow in its action, and the management of which is far from perfected, that it should all at once supersede the more sure operation. The condition of primary tumours appears to me to make them particularly unfit for this treatment, for whilst they are growing, and may be large, the acid can only be thrown into them in small quantities, and at intervals. If used in a large quantity, it produces suppuration or sloughing, a disastrous action of a remedy in a primary cancer; and in any quantity it produces swelling, with consequent uncertainty as to the area over which the effect of the acid has been secured, and delay in pursuing the treatment. Meanwhile the tumours continue to grow in the parts concealed by the swelling. I cannot think this to be right treatment of a primary cancer.

Such objections may appear to relate no less to a secondary, recurrent, or advanced, than to a primary tumour; but the circumstances are in fact very different. The treatment of the latter disease is avowedly undertaken with less prospect of advantage than that of the primary. In those advanced cases the acid can achieve the reduction always, and sometimes the removal of the morbid mass; and it is only in such cases, where established methods of treatment are unsatisfactory, that those which make greater promise ought to be proved.—*British Med. Journal, Feb.* 9, 1867, *p.* 138.

6.—LARGE CANCEROUS TUMOUR OF THE NECK AND FACE TREATED BY INJECTION OF ACETIC ACID.

Under the care of Dr. BROADBENT and Dr. RANDALL, at St. Marylebone Workhouse.

The tumour was of large size, and extended so far in the neck as to interfere with deglutition and displace the larynx. The first injection on October 3 was followed by extensive destruction of the diseased mass, and it was then found to have arisen primarily from the bones of the face. The muscles and vessels in the neck were laid bare, but healthy granulations sprang up, and the wound in the skin was contracting.

On Oct. 23 the note was:—Healing rapidly, progressing below; still great enlargement about the face. Great cavity at seat of last injection (over lower jaw). Patient more comfortable.

26th.—The old woman looking and feeling decidedly better. No great change in the face. The cavity had been filled, and the wound dressed with cotton saturated with dilute acid.

A solid mass about the centre of the disease, over the superior maxilla, was injected, the needle being passed to near the limits of the disease. The acid was retained better than before; it gave greater pain. An injection also upwards, in the direction of the malar bone, not well retained.

The needle could not be passed equally in all directions, bony projections being met with too firm for penetration.

30th.—Again injected. The needle was forced through a series of thin bony laminæ in an upward direction.

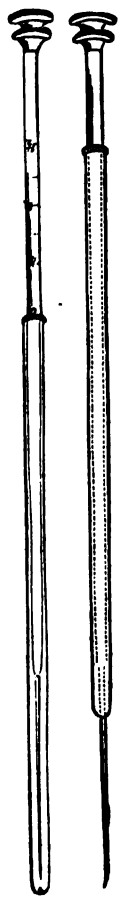
Nov. 6.—Considerable pain and inflammation followed the last injection for two or three days, and there was a copious discharge. No marked

change in the tumour could be detected, the bony prominences preventing the skin from subsiding. No injection was made.

Later, after careful examination, it was decided to watch the progress of the disease for a time before pushing the treatment further. It was evidently not possible to eradicate the tumour, springing as it did from bone. The osseous projection interfered with the passage of the needle, and the intervening structure was so soft as to allow of the ready escape of the fluid. There was no longer any danger to life, or any considerable suffering, and thus no object existed of sufficient moment to warrant the infliction of the pain which must have attended any attempt to remove the disease completely.

Dec. 20.—No occasion for interference has arisen. The tumour has increased somewhat in size, but not so as to add materially to the existing deformity. Mastication is rendered difficult, but she swallows well, and is in a state of comparative comfort.

The only result which could be looked for in this case was destruction and sloughing, and it was one of those exceptional instances in which the employment of acetic acid to this end could be recommended. The tumour caused suffering, and, from its size, threatened the life of the patient. Removal by the knife was out of the question. Experience had given sufficient reason to believe that the acid injected would destroy the vitality of the morbid growth, and would discriminate between healthy and diseased structures. It was hoped also that there would be little pain or constitutional disturbance. The expectations formed were justified. The great size of the mass forbade the attempt to remove it at once, but more might have been done at first with advantage. The acid used was of uniform strength throughout, —that is, one of acid to three of water.—*Medical Times and Gazette, Feb.* 23, 1867, *p.* 194.



7.—A NEW INSTRUMENT FOR INJECTING CANCEROUS TUMOURS OF THE UTERUS AND RECTUM.

By T. J. Ashton, Esq., Consulting Surgeon to the Marylebone Infirmary.

[The treatment of cancer by means of injection with dilute acid is still *sub judice*, time only can decide as to its value.]

In injecting uterine and rectal cancer, I found the long slender jet hitherto adapted to the instruments very inefficient, for the reasons, that it was difficult to avoid catching the point in the vagina or rectum, or puncturing the finger which served to guide it to the part of the tumor intended to be injected, and also to ascertain how far the jet had penetrated. To obviate these objections I have had made two tubes, the one sliding on the other. To the inner one is attached a fine gold jet with a sharp point; the outer one, which is the size of No. 6 urethral catheter, and two inches shorter than the inner tube and jet combined, is rounded at the upper end, and perforated by a hole sufficient to admit the passage of the jet. The two tubes combined form a large blunt jet, which, being fitted to a syringe, is readily passed along the finger, without the possibility of injury either to the operator or the patient; the outer tube is arrested by contact with the tumour, and the inner tube is pushed on, making the jet penetrate the tumour, the depth to which it does so being indicated by the graduations at its outer extremity.

The annexed woodcuts show at a glance the details and principle of the instrument. It was made by Mr. Mayer, of Portland street.—*Lancet, Jan.* 19, 1867, *p.* 80.

8.—INJECTION OF SCIRRHUS WITH ACETIC ACID.

By Peter Stewart, Esq., Glasgow.

[The following suggestion is interesting and of much practical value :]

At a consultation with Dr. Lyon and Dr. J. G. Fleming on a patient of mine with a scirrhous tumour of the right mamma, it was resolved to try the treatment by injection with acetic acid, lately introduced by Dr. Broadbent. On the 6th of last December the treatment was commenced, and was followed for four hours by severe pain. In a few days the injection was repeated, and the pain continued eight hours. Dr. Fleming therefore suggested that one-third of a grain of the acetate of morphia should be added to the injection. On the next occasion that was done, and in a few minutes the patient fell asleep, and slept soundly for four hours; when she awoke she was free from pain. The acetate of morphia has been added to every injection since, and always with the same happy result. The tumour was diminished considerably, and the nipple, which was very much retracted, is now much less so.—*Lancet, Feb.* 9, 1867, *p.* 191.

9.—ON THE DIAGNOSTIC VALUE OF THE RETRACTED NIPPLE AS A SYMPTOM OF DISEASE OF THE BREAST.

By Thos. Bryant, Esq., Assistant-Surgeon to Guy's Hospital.

[Mr. Bryant asserts in the following paper that retraction of the nipple is to be found under many different conditions. In the simple disease of the mamma, as well as in the malignant—in the inflammatory affections, as in others of a more morbid nature. As retraction of the nipple is a symptom, upon the presence or absence of which we all more or less rely in forming a diagnosis of mammary tumours, the subject is equally interesting and important.]

To the congenital, or naturally retracted nipple, I shall not allude, further than to state that it is well, on examining a diseased breast with this condition of nipple, to bear this fact in mind, that the retraction of the part may have been a natural one.

The first series of cases to which I shall draw your attention, in which this condition of nipple was present, will be the inflammatory.

Case 1.—*Chronic Inflammation and Suppuration of the Breast with Retracted Nipple.*—Mary R., aged 41, a married woman, the mother of nine children, all of whom she had easily suckled, came under my care on August 25th, 1864, with an affection of her right breast.

She had been confined nine months previously, and had been able to suckle for a few weeks with the affected breast, but had not done so for some months when coming under observation. The disease had commenced with an inflammation of the gland, accompanied by great swelling, heat, and redness. By treatment, this had gradually subsided; but the parts were left hard, and somewhat tender. In about three weeks from its first appearance, the nipple began to disappear, and in about one month it had completely retracted. When seen, the breast appeared as a large globular tumour, of a firm consistence and semifluctuating feel. It was not very moveable, although it was not fixed; but the integuments over it were evidently "glued" by inflammatory effusion to the parts beneath; the nipple was completely out of sight; the axillary glands were unaffected.

Manipulation caused the patient some pain, and a dull aching of the part was also present. The woman's powers were very low. Tonics and good living were prescribed, with fomentations to the breast. On September 1st, indications of the presence of pus were tolerably clear; some thinning of the integuments and parts beneath showing themselves near the nipple. The abscess was accordingly opened, and a large quantity of healthy pus evacuated. In three weeks this abscess had contracted, and had completely healed; but the nipple remained retracted, and the gland indurated; this latter, however, had much diminished. On July 13th, 1865, nine months after treatment, the breast was natural, but the nipple was still out of sight.

Case 2.—*Chronic Abscess in the centre of the Breast. Retracted Nipple from the appearance of the Disease.*—Sarah M., aged 20, came under my care on December 31, 1863. She was a married woman, but had no children. She had enjoyed good health till eight months previously, when she received a blow upon the left breast. It was accompanied by severe pain, and was followed by swelling; this swelling gradually increasing.

When seen, the breast was much larger than natural, and to the hand felt hard and fluctuating; a globular tumour evidently existing in the centre of the gland. The nipple also was completely retracted; this retraction having come on gradually since the receipt of the blow. An incision was then made into the tumour at its lower part, and several ounces of pus evacuated. Convalescence rapidly followed. The condition of the nipple, however, remained unchanged.

Case 3.—*Chronic Abscess in both Breasts; Retraction of the Nipple.*—Rachel B., a childless, married woman, aged 28, applied to me at Guy's Hospital on November 10, 1864, with an affection of the right breast. It had existed for one week, and had come on without any recognised cause. It began by swelling; and appeared as a globular, tense, fluctuating tumour, in the centre of the mammary gland. The nipple, which had been quite natural, was completely retracted. An abscess was diagnosed; and a poultice ordered, with quinine. In two weeks, the abscess was opened, and three ounces of healthy pus evacuated; and, in another week, the breast had healed. The gland, however, remained indurated; and the nipple retracted on December 7th.

On February 1, 1865, this same patient reappeared before me with a similar disease, running the same course in the left breast. The inflammation came on without any known cause. An abscess formed in the centre of the mammary gland, which required opening, and the nipple also retracted in the same way. On May 21st, 1865, the report states that the nipples were still retracted.

Case 4.—*Retracted Nipple, the Result of a Chronic Inflammation of the Mammary Gland.*—Emma W., aged 35, a married woman, the mother of two children, the first, eight years since, applied to me at Guy's Hospital, January 19, 1865, with an inflamed and thickened right breast. It came on after her first confinement, eight years previously, with suppuration, and had become worse, three years ago, after her second; a sinus had existed behind the breast since that date, but the nipple had been retracted since the first attack. Her general health was good.

A drainage-tube was introduced into the sinus through its most dependent opening, and tonics given. In two months, the sinus had healed, and the woman left cured. The nipple, however, was still retracted.

Remarks.—In the cases I have already quoted, it will have been observed that the retracted nipples are the result of a chronic inflammatory affection of the mammary gland; and it is to be remarked that the retracted nipple was left as a result of the disease.

The next case I propose to read will illustrate the fact, that an acute inflammation of the gland may produce a similar condition.

Case 5.—*Abscess in both Breasts of an Infant. Retracted Nipples.*—A female infant, aged two weeks, was brought to me at Guy's Hospital on December 22d, 1864, with abscesses in both breasts, brought on by the foolish attempt of an old nurse to express the secretion from the glands which always exists after birth. It had been present for ten days, and the inflammation was very severe. The glands were much swollen, and as large as half a walnut. The nipples were also completely retracted. The breasts discharged freely for some days, and then recovered. The contracted nipples, however, remained.

Remarks.—In the cases already quoted of inflammation and suppuration of the breast—a few only of the many which could be extracted from my note-book—the retraction of the nipple was a marked symptom; and they are amply sufficient to prove the truth of the remark, that such a condition is by no means unfrequent in connection with inflammation or suppuration of the

mammary gland. It may occur during the progress of an acute or chronic inflammation in either an infant or an adult; and, it has been already shewn, may be an early accompaniment and result of a chronic abscess.

I will now pass on to show that the same condition of nipple may exist in another simple disease of the mammary gland, the cystic disease, and to demonstrate the fact by the quotation of cases.

Case 6.—Retracted Nipple associated with the true Mystic Disease of the Right Breast, for which Excision was successfully performed.—Anne C., aged 49, a married woman, the mother of five children, all of whom she suckled, came under my care on April 17th, 1865, with a disease of the right breast of four and a half years' duration. It began by a swelling on the outer side of the gland, and this has gradually increased. The nipple, which had been quite natural, soon disappeared, its position being indicated by a deep depression. The tumour had also been tapped at least six times, a brown glairy fluid having been drawn off at each operation. On her coming under observation, the breast and tumour were very large, measuring about a foot from axilla to sternum. The disease was evidently cystic; for its outline was smooth, globular, tense, and fluctuating. The skin was much stretched over the growth beneath, and adherent in several spots from the frequent tappings, but not in any way diseased. Firm pressure upon the tumour was also followed by a copious discharge from the nipple of a glairy, blood-stained, mucoid fluid; or rather from the depression representing its position. This discharge had been present at times during the whole life of the new growth. The patient's general health was good, and there was no disease of the axillary glands. I tapped the cyst, and drew off several ounces of the same glairy blood-stained fluid which had been drawn off on previous occasions; and, finding much solid growth beneath, advised excision. This was done on May 30th, and a rapid recovery took place.

The disease turned out to be a fine specimen of the *true* cystic disease of the breast-gland; that is, a disease of the gland itself developed within its ducts, the cysts containing intracystic growths and more or less glairy fluid.

Case 7.—Mystic Disease of the Breast. Retracted Nipple.—S. M., aged 67, a married but childless woman, applied to me on June 13th, 1864, with a disease of her right breast of two years' standing. It had appeared as a gradual enlargement, and had been unaccompanied by pain. Her general health was also good. When coming under care, the tumour was evidently situated in the breast itself, and with it formed one mass; it was of about the size of a large fist, and very pendulous, hanging down from the thorax. It was quite moveable, and the integuments covering it in were healthy and uninvolved. The tumour was evidently made up of solid growth, as well as of cysts; these latter being of various sizes. The nipple was thoroughly retracted, and had been so for one year. There was no discharge from it, or any enlargement of the axillary glands. An operation was advised for this patient, but her consent was not obtained. She remained under observation for one month, when she left town.

Retracted Nipple in Cancer of the Breast.—The value of a retracted nipple as a sign of cancer will now occupy our attention; and I have placed it last on our list, as I thought it well to demonstrate first of all the fact that such a symptom is by no means an uncommon associate of the inflammatory and cystic diseases of the breast; and that, as a consequence, it cannot with any certainty be regarded as pathognomonic of the cancerous affections. That it does occur in connection with a cancerous tumour of the breast, is not to be disputed; but that it is a frequent accompaniment of such a disease, is open to doubt; for, on looking over my notes of 222 examples of cancer of the mamma, I find that a retracted nipple existed in only 32 cases, or in about 14.4 per cent. Should the surgeon expect, therefore, to find it in all cases of cancer, he will be disappointed; and should its absence in certain cases lead him to regard a tumour as innocent, he will, in the majority of cases, be found wrong. This symptom may be found in the infiltrating form of cancer of the breast, whether partial or complete; that is, when the disease has involved the whole gland, or only a lobe. It may also exist in some examples

of the tuberous cancer, in those instances in which the tuber is developed between the ducts, and by its growth separates them—thus acting mechanically upon the nipple, and causing its retraction, under such circumstances, taking place towards the diseased part (Case 9). In the generally infiltrating form of cancer, the nipple simply retracts; and, at a later stage of the disease, it may reappear (Case 8), this reappearance being due to the increase of the disease and the mechanical pressure of the nipple forwards by the tumour beneath. These facts will be illustrated by the following cases.

Case 8.—*Infiltrating Carcinoma of both Breasts: Retraction of the Nipple in both during the Early Stage of the Disease; its subsequent Projection in one, in the Later Stage.*—Mary W., aged 58, a married woman, the mother of four children, all of whom she had suckled without difficulty, came under my care at Guy's Hospital on August 22, 1864, with cancer of both breasts. The disease had existed in the left side for two years, and had appeared as a general induration of the mammary gland. The nipple, also, soon began to retract, and the skin to become involved by infiltration. In about one year after its first appearance, the nipple reappeared; and when coming under observation, it was as prominent as it is usually found. The whole breast was very large, and generally infiltrated. The skin over it was adherent, and covered with cancerous tubercular infiltrations. The axillary glands on that side were also diseased.

On the right side, the breast was similarly affected, although not to such an extent as the left. The disease had commenced in the right gland one month previously, by a general induration of the gland, and retraction of the nipple, the nipple having entirely disappeared. The skin was also slightly puckered. In about one month, tubercles appeared in the integument, and the axillary glands began to enlarge—the woman's health rapidly failing; the last notice in the report being on October 13, that the patient was sinking.

Case 9.—*Tuberous Carcinoma of the Right Breast, and Retracted Nipple.*—Eliza Lee, a childless married woman, aged 54, came under my care at Guy's Hospital on July 28th, 1864, with a disease of the right breast of one year's standing. It had commenced by a swelling situated on the outer side of the right mamma, of a hard and stony character. this swelling gradually increasing. After six months a change appeared in the nipple, a slight dragging of the part towards the tumour being very manifest. This retraction steadily progressed; the nipple, when coming under observation, being drawn completely in. The axillary glands also began to enlarge, and the integument in the tumour to be infiltrated. When coming under my care, the tumour was of about the size of an orange, globular in outline, and very hard; it was evidently situated in the outer or axillary border of the mammary gland. The nipple was retracted almost out of sight, and drawn towards the diseased part. The tumour was fixed to the parts beneath, being quite immoveable; and the skin over it was also infiltrated. The axillary glands were likewise enlarged. In about one month, the skin began to ulcerate, and the powers of the patient to fail; the last report, made on November 24th, being, that the breaking up of the cancer was progressing rapidly, and the development of the tubercles in the integument increasing. The patient's powers were fast failing.

Remarks.—We have thus shown that a retracted nipple is an occasional symptom in acute and chronic inflammation of the breast; that it is found in the cystic disease of the gland, as well as in the cancerous; in fact, that it is met with *in all the diseases of the true gland, whether simple or malignant.* It is absent in the ordinary chronic mammary or adenoid tumours, simply because these tumours are not of the gland itself; and, as a consequence, the nipple, with the gland-ducts, are not interfered with. In what way, then, it may be asked, is this retraction of the nipple generally brought about? It must depend on some general or simple cause, as it is found under so many different conditions; "for," as I have stated in another place (*Clinical Surgery*, Part v., p. 429), "a retracted nipple may be described as an accidental symptom in the development of a tumour; it is the product of mechanical

causes, and its presence is determined by the manner in which the gland is involved in the disease, rather than in the nature of the affection itself. Should any tumour, simple or malignant—should any abscess, chronic or acute—attack the centre of the mammary gland, a retracted nipple, in all probability, will be produced; for, as the disease so placed will necessarily cause material separation of the gland-ducts, their extremities—terminating in the nipple—must be drawn upon, and, as a consequence, a retracted nipple will be the result."

In an early stage of an infiltrating cancer of the organ, this symptom is one of *occasional* occurrence; the nipple being drawn towards the side of the gland, which may be involved. At a later stage of the disease, however, when the infiltration is more complete, the nipple may again project. In a central chronic abscess of the breast, the retracted nipple is equally common; and, in the true cystic adenoceles, it may be also present. The explanation of the cause of this symptom in all of these cases is alike, being purely mechanical, and in a measure accidental.—*British Medical Journal, Dec.* 8, 1866, *p.* 635.

10.—ON PYÆMIA.

By WILLIAM S. SAVORY, Esq., F.R.S., Assistant-Surgeon to St. Bartholomew's Hospital, and Lecturer on Physiology in the Medical School.

[Mr. Savory considers the word pyæmia an unfortunate one. It was framed on the idea that in these cases pus must pass into the blood, and that its cells could be there demonstrated. Now that the pathology of pyæmia has been farther investigated, there appears to be no good grounds whatever for the idea that pus in the blood is a necessary link in the chain of causation. The distinction between ichoræmia or septicæmia and pyæmia cannot be established.]

The nature of pyæmia, and the best mode of preventing its occurrence, are more likely to be thoroughly worked out when the investigation is no longer clogged by the notion that it is necessarily due to a specific cause, or invariably associated with a peculiar local action. The view of pyæmia is at once enlarged in every direction when separated from the action of pus as its sole cause, and from phlebitis or thrombosis as a necessary condition.

Cases of pyæmia, sufficiently well marked to be generally recognised as such, vary widely in character. Many degrees of it are met with, from its most intense form, when it kills in a few hours, before the local effects have time to supervene, through the more ordinary acute attack in which the striking local effects are developed with appalling rapidity, on to its more chronic variety, in which whatever general disturbance there may be escapes observation, and in which the local effects, few and far between, may be referred to some other cause.

The two following cases, for undoubted examples, contrast strongly and mark distinctly very different forms or degrees of pyæmia.

A strong, powerful man, aged thirty, a soldier, who had gone through much hard service, was admitted into St. Bartholomew's Hospital in August, 1863. A firm oval tumour, ill-defined, about two inches broad, uniform in outline, and somewhat tender on pressure, occupied about the inner half of the right clavicle. It had existed about three years, but until lately had given him very little trouble. He said his health was perfect, and no mischief of any kind could be detected elsewhere. The tumour was removed by operation, which was necessarily tedious, on account of the careful dissection required ro detach the tumour from the subjacent parts. The clavicle was divided about an inch and a half from its acromial end, where the bone was healthy, and disarticulated at the sterno-clavicular joint, which was not involved. In the operation no vessel was divided of sufficient size to require a ligature. The tumour was in all probability an example of osteoid cancer.

The wound was closed, covered by a pad of lint, and the arm was band-

aged to the side. The wound appeared to heal rapidly, and the man went on well without a bad symptom for ten days, when suddenly, without any warning, he had a severe rigor, followed by profuse sweating, and pain in the left arm.

During the next twenty-four hours his expression became anxious and distressed. He sweated profusely. His pulse rose to 130, and his breathing grew correspondingly rapid. Then the heart's sounds, although clear at the apex, were confused and accompanied by a distinct friction-sound at the base. Then the left wrist-joint became swollen and painful, but not hot or red. All this time the wound looked well, and the tissues around appeared healthy. The profuse sweating continued. The features, alternately flushed and pallid, became pinched and haggard. The pulse varied, but was always very rapid. The knees and other joints were soon swollen and painful. Abundant vesicles with inflamed bases appeared, but throughout there was no evidence of any pulmonary complication, and the wound never looked unhealthy. He sank rapidly, and died on the sixth day from the appearance of the unfavourable symptoms, and fifteen days from the date of the operation.

Autopsy, twenty-four hours after death.—The wound was partially closed, but the tissues around the inner part were the seat of diffuse suppuration. The remaining portion of the clavicle was natural. The left sterno-clavicular joint contained pus. The left wrist and intercarpal joints were healthy, but the sheaths of the extensor tendons crossing them were full of pus. No pus was found in the joints of the opposite upper or of the lower extremities. The surface of the lungs was dotted over with small spots like ecchymoses gathered into clusters, many of them with soft yellowish centres. Posteriorly these organs were considerably congested. The pericardium contained some yellowish turbid fluid. Its cardiac portion was dull, mottled, rough, and about the base beaded with small nodules of easily detached lymph. In the substance of the heart were a few spots like those in the lungs. The endocardium and valves were healthy. Nothing abnormal was discovered in any of the other viscera, or in the condition of the veins of the neck around the wound or elsewhere.

Now contrast with the foregoing the following case:—

A pale, flabby, rather stout Irishman, aged sixty-three, was admitted into the hospital on February 24th, 1863. A scirrhous tumour, of the size of a walnut, involved the right mamma. He could not tell how long it had existed, but he had been aware of it some months. No enlargement of the axillary glands. Four days after his admission the tumour was removed. Very little blood was lost. During the first week after the operation he complained of an unusual amount of pain in the wound, and was altogether low and depressed. He slept badly. Brandy and opiates were given regularly. The wound suppurated, but made little advance towards repair. Besides six ounces of brandy daily and full diet he took a drachm of liquor cinchonæ thrice a-day. During the second week, after the operation, the whole of the left lower extremity became œdematous and much enlarged. He complained of great pain in it, which gradually increased. There was no mischief about the superficial veins. No material amount of constitutional disturbance, but he appeared to be much exhausted. In the course of another week the swelling of the thigh gradually subsided, but the calf became indurated and very painful, and at length (March 20th) deep fluctuation was detected in that region. A free incision allowed about eight ounces of well-formed pus to escape. He had no rigor.

For the next twelve weeks he was very ill and feeble. Matter successively formed in different parts of the leg, and afterwards in the right axilla. The thigh still remained swollen, but no matter formed above the knee. He lost flesh, and hectic fever appeared, and became well marked. All this time he was supported by nourishment as much as he could take, and stimulants, in the form of brandy, whisky, and porter, with bark. The wound in the breast at length slowly cicatrised; the discharge from the abscesses in the leg and axilla gradually subsided, and the wounds healed. By the uniform

pressure of bandages the limb was gradually reduced in size, and at length he was sent into the country convalescent five months after the operation.

But is not the evidence of blood-poisoning much oftener present in the course of certain affections than it is generally supposed to be; because the symptoms, although too striking not to attract attention and excite anxiety, are referred to other causes? The following case is, I believe, an example of a slight and transient form of blood poisoning.

In June, 1865, I removed a small sebaceous tumour from a man's scalp. It was not larger than half a marble, and was situated on the right side, a few inches above the ear. Through a simple incision it was turned out without the slightest difficulty, and the wound, or at least the edges of it, united by direct adhesion. For the two following days there was no evidence of any disturbance whatever. Then the site of the tumour became somewhat puffy, as if fluid were accumulating beneath, and the man felt very ill and low. When I saw him at this time I was struck by his aspect. He looked very ill. His countenance was sunken, and he complained of much depression. He could neither eat nor sleep, and he had had one or two rigors. The glands in the right side of the neck were much enlarged, painful, and tender. Under the new united incision there was distinct fluctuation, and, when it was divided, well-formed pus escaped. From this time he gradually recovered without any farther mischief. Now this would once have been looked upon as a case of constitutional irritation; but was it not really a case of transient blood-poisoning?

Here is another illustration.

A delicate man, about sixty years of age, whose health had been previously failing for some months, consulted me on account of a large chronic abscess over the right buttock, which proved to be connected with diseased bone about the crest of the ilium. The abcess, and smaller ones which subsequently formed, gradually contracted, and at length nothing but fistulous passages remained, which led to bare bone. He has struggled on in this condition for several months, adopting every means which could be suggested to sustain his strength. But the present interest of the case lies in the fact that from time to time, and somewhat suddenly, all the signs of active constitutional disturbance would arise: fever, beginning with chills or distinct rigors, and accompanied by pains which he called rheumatic, by an icteroid tint of the surface, and by albumen in the urine. In a few days all these symptoms would gradually pass away, and leave him as before. I regarded them as indications of transient blood-poisoning from the absorption of the fluid furnished by the diseased parts.

Again, in ozœna, for example, after the fetid purulent discharge has existed for weeks or months, without any sensible impairment of the health, rather suddenly the little patient will become extremely ill. There will be rapidly increasing weakness, running on into alarming prostration, with petechial spots over the surface, and all this without any other local mischief or imaginable cause than the ozœna. Such symptoms occurring under such circumstances are pathognomonic of blood-poisoning, and no other source of this can be detected than the ozœna. Why, after having existed so long without producing these effects, it should suddenly give rise to them is certainly difficult to explain. Such a putrid fluid as is formed in these cases is quite equal to the mischief; but we can no more explain why it should pro duce it at a particular time than we can explain the equally variable results of exposure to infection generally.

Here is a case in point.

A delicate little girl, at the age of five years, became subject to ozœna, which has continued with varying degrees of intensity during several years. Within this period, although obviously delicate, yet her general health has been, on the whole, tolerably good, with one remarkable exception. In her tenth year she became in a few days alarmingly ill and depressed with all the symptoms of low fever, and the whole surface was abundantly covered with petechiæ; but there was no internal hemorrhage. The countenance became pinched and expressive of collapse; the skin was dry and harsh; the pulse at

times 140 or 150, and extremely feeble; the tongue dry and brown; the stools offensive. She could take little but brandy and champagne, by which means life seemed to be sustained for some days. She slowly recovered, and became as before. Was not this a case of blood-poisoning by the absorption of the fetid matter of ozœna?

What is commonly termed gonorrhœal rheumatism is held by some to be simply due to blood-poisoning from the absorption of matter furnished by the urethra, and therefore allied to pyæmia. Thus Dr. Chambers writes—"It is really due to a poison absorbed into the blood from a mucous membrane affected with purulent gonorrhœa, and thus has more claim to be classed by the side of pyæmia than in the position where it is now placed." And he points out what he considers to be the points of resemblance between the two affections.

That some forms at least of so-called gonorrhœal rheumatism are of this nature I cannot doubt. The following case appears to me to be a very suggestive one.

A man, aged twenty-two, was admitted into the hospital on July 5th, 1864, on account of great pain and swelling in the parts around the left shoulder. There was no marked redness, but an obscure sense of fluctuation at the front border of the deltoid muscle. The forearm and hand were much congested and œdematous, but not painful. There was only very limited movement at the shoulder-joint, and this with much suffering, but with no preceptible grating or roughness. He was much exhausted, and looked very ill. He was an ostler, and had been in tolerably good health until fourteen days ago; but for some months past he had suffered from a tedious attack of gonorrhœa, with swelling of one testicle. He alluded also to frequent rheumatic pains flying about him. He had been rather badly off, too, and had not always had sufficient food. Fourteen days before admission came rigors and headache, and the next morning his shoulder was stiff and swollen. The rigors recurred frequently since, and at times he sweated profusely. He was compelled to keep in bed, though without proper nourishment or care. He could not account for his illness in any way, and had certainly met with no accident. There still remained some urethral discharge. He was ordered ample nourishment and stimulants; morphia in full doses.

The day after his admission, when he had somewhat rallied, an incision was made along the front of the shoulder, in the interval between the pectoralis major and deltoid, which opened a very large abscess containing some pints of well-formed pus. It was still doubtful whether the joint was implicated. A few days later another opening was made in the axilla, allowing a still freer escape of pus.

For some days there was no change to note in his condition. A profuse discharge continued. He was pale and exhausted, generally bathed in perspiration, with a pulse above 100, unable to take much food, disturbed and rambling in his sleep. On the 10th, in the evening, his respiration became hurried, shallow, and distressed; the face was flushed, and sweat streamed down it; skin hot, and studded with sudamina; with here and there on the arms and abdomen some dull-red, slightly elevated spots with inflamed bases; pulse 115, small. A very large pericardial friction-sound was heard on the left side, and a systolic endocardial murmur at the apex. As far as could be ascertained, too, there was some diffused bronchitis through the left lung. Ordered: counter-irritation; bark; morphia at night; nourishment and stimulants freely.

During the next two days he rallied. The signs of bronchitis disappeared, and the cardiac friction-sound and murmur became less distinct. But he lost flesh and still sweated profusely. The eruption became very abundant and much more widely distributed, and now appeared as well-marked vesicles filled with puriform fluid, with very bright red bases. Then his left knee-joint became painful and swollen, and at length full of fluid. His heel, apparently from mere pressure on the bed, became inflamed, and a large abscess formed around his ankle. This was opened, and discharged copiously, the wounds about the shoulder-joint still continuing to pour forth pus freely.

This also extended along the course of the brachial vessels, and eventually his shoulder-joint was but too clearly found to be disorganised.

For some time the issue of the case seemed doubtful. No other abscesses appeared, and now and then he rallied so as to arouse the hope that he might struggle through. Suddenly, however, his right knee was found painful and full of fluid. He became much jaundiced and rapidly sank. The friends would not allow any kind of examination to be made of the body.

But I am assured that cases of blood-poisoning occur the characters of which are yet more obscure than in any of the foregoing examples, and the symptoms of which are often still, as they hitherto have been, referred to some other affection.

One cannot, I think, resist the conviction that certain diseases which have been hitherto referred to particular organs are originally affections of the blood. Are not some forms at least of so-called disease of the kidney of this nature? No doubt the kidney may be, and often is, primarily at fault; but does not the presence of albumen, in some of its forms, in the urine in certain cases, point to the blood rather than to the kidney as the seat of the mischief? When we remember that it can be experimentally shown that certain forms of albumen, if admitted directly into the blood without having been previously subjected to the action of the gastric juice or liver, are in some measure drawn off by the kidney and appear in the urine, as also does the substance known as albuminose if it remain untransformed in the blood, and this as a simple consequence of the facility with which it traverses organic membranes, we seem to have a key to the interpretation of some of the disorders which are included in the term "albuminuria." So again some forms of "pneumonia" are now regarded as the effect of a morbid condition of the blood; the pathology of these cases—as, for instance, the congestion and inflammation of the lungs supervening in fevers—being indicated by the morbid condition of the lungs which may be experimentally produced by the injection of poisons into the blood.

Take in illustration the following case, in which a putrid discharge from the nose was followed by symptoms of disease of the kidneys—prolonged albuminuria and anasarca.

A tolerably healthy man, about fifty years of age, who had lived freely in his former years, complained of pain and uneasiness in the nostrils, and this was soon followed, by a fetid, purulent discharge, which, though small in quantity, persisted obstinately, in spite of various measures, for some weeks. Beyond increased vascularity and abrasion of the mucous membrane nothing wrong could be discovered. At length, while the discharge still continued, his health gave way. He lost flesh and strength very rapidly, and was evidently seriously ill. Then albumen, in considerable quantity, appeared in his urine, which, however, was otherwise normal; and there was no local evidence of disease of the kidneys. This state of things remained for two or three weeks, when increasing emaciation and debility, and commencing anasarca, excited the gravest apprehensions. But he was removed to the seaside, and there he gradually improved. The discharge from the nose and the anasarca disappeared. He gained flesh and strength, and returned to town much better, but still with albumen constantly present in his urine. This in course of time diminished, and would for days together wholly disappear; but even for many months it could be occasionally found there. His health has never been equal to what it was before the attack.

The phrase "constitutional irritation" has been made familiar to us by the title of the well-known work of Mr. Travers. It is often employed to express an idea of the nature of certain symptoms resulting from a local injury. Many examples of this are described at length in the work just referred to, and elsewhere. Now I cannot but think that a careful analysis of some of these cases, of the characters they present, of the relation of the general to the local symptoms, of the nature of the local mischief which for the most part determines the constitutional disturbance, and lastly, a careful comparison of these with other cases of undoubted blood-poisoning, will lead to the conviction that the blood rather than the nervous system is the channel through

which the local passes into a general disease; that these cases are not, like some others, to be explained by the sympathy of the whole with a part through the nervous system, but rather that, here, the blood is contaminated by morbid matter formed in a part and so the whole is poisoned. I would not argue, of course, that every case is of this nature. I do not mean to suggest that all cases of so-called constitutional irritation are to be thus explained. No doubt certain of them might be selected as instances of a general disturbance from a local irritation through the nervous system; but what I submit is, that in those cases which as a class are distinguished by well-marked and severe constitutional disturbance following, after an interval, upon what are called poisoned wounds—that in these at length morbid matter passes into the circulation, the blood is poisoned. It seems to me that the conclusion is the only one strongly supported by the evidence which a careful analysis of these cases yields.

See the cases related at pp. 177, 189, 193 (of this case Mr. Travers remarks, "The concluding part of this history resembles the action of a subtle poison absorbed into the system"), 199, 220, 225 of Mr. Travers's work for examples of what may have been cases, not of "simple irritation," but of blood-poisoning.

Erysipelatous inflammation around the wound, pain radiating therefrom—for instance, passing up a limb,—enlarged glands beyond, followed by abscess and fever, seem referable to poison rather than to the action of "a simple local irritant."

There is satisfactory evidence that not only erysipelas, properly so called, but also erysipelatous or diffuse and spreading inflammation of the skin and cellular tissue—commonly called by surgeons erysipelas,—is due to blood-poisoning. This view, which is in accordance with the character of the affection presented during life, is established by the results which are often disclosed after death.

Hectic fever is considered by some to be a chronic form of pyæmia. And when the character of hectic fever is considered, and the nature of the local affection upon which it so often supervenes, it must be admitted that the idea is not an unreasonable one. Mr. Hilton says—"I venture to reiterate the opinion which I have oftentimes expressed in my systematic lectures on Surgery, that the pathological cause of hectic fever associated with chronic abscess, or following its being opened, is absorption of unhealthy fluid engendering pyæmia."

Various disturbances of the general health may be due to slight and transient poisoning. The characters of many febrile attacks point to this.

If a disease be really infectious or contagious, catching as people say, there must be, it would seem, some *materies morbi*, some matter which is capable of transferrence. Excluding, of course, from consideration the propagation of such a disease as hysteria, in which, by the force of example, this morbid state in one person may provoke an outbreak in another, we cannot, I think, conceive the communication of disease from one person to another without assuming the existence of some morbid material. We cannot, I think, conceive how any disease which consists only in a perversion of the normal forces, or in an alteration of any normal structure, could be transferred from one person to another. So, again, we can see no good reason why a contagious or infectious disease may not, under favorable conditions, become epidemic; but an epidemic disease may not be, necessarily communicable, for we may believe it to be produced by certain conditions to which a number of persons are simultaneously subjected, without assuming the existence of any morbid matter whatever.

Of course, in many instances opinions differ concerning the existence or presence of a material poison—in rheumatism, for example, and in some forms of cutaneous eruption,—but, excluding doubtful illustrations, there are many others left. For example, doctors are tolerably well agreed that a material poison of a definite nature, introduced from without, is at work in small-pox and syphilis.

On the nature of the poisons which produce what are called zymotic dis-

eases we can at present only speculate. There is every reason to refer them to the organic kingdom; and whatever differences they may present among themselves—and that they are various seems shown by their effects,—they present these great features in common: they effect changes in the blood during a period of what is termed incubation, whereby they are themselves abundantly multiplied or reproduced. By this they are distinguished as a class from all others.

The effects of most poisons, as those furnished by the mineral kingdom, vary generally as the dose; but this cannot be said of all, of some animal poisons. So far as we know, the minuteness of the dose of these offers no guarantee that the effects produced will be proportionately mild. These latter then must have some mode of action beyond the former. Thus the poison may be either capable of reproduction in the blood, as those which produce zymotic diseases, or at all events it must be capable of exciting changes in the blood in a different way and of a different kind from those produced by mineral poisons. The effects, for example, of the minute quantity of animal poison introduced through a puncture in dissecting cannot be explained by any mode of operation such as we may imagine mineral poisons to possess.

Now with regard to the poison exciting pyæmia as it commonly appears after injuries and operations, although, so far as clinical observation goes, whatever indications there may be, there is no clear evidence that the effects vary as the dose, yet in experiments upon animals the quantity of putrid matter or pus injected has a manifest and most important influence upon the result. Concerning these animal poisons, however, the question, What influence has the mere quantity of poison introduced upon the result? can never be answered while we are ignorant of the actual nature of the poison or poisons which act, of their mode of operation, and of the extent to which their action may be qualified by different conditions of the system.

Dead and decomposing animal matter is unquestionably more akin in its operation to inorganic and vegetable poisons than to those which provoke zymotic diseases. Although the first and last present many features in common, such as the general symptoms they produce and the individual organs they effect and through which they are eliminated, and although the poisons in each case differ among themselves, both in character, such as volatility and action, such as local determination, there is no evidence whatever that any dead and decomposing animal matter is ever multiplied or reproduced in the blood, or effects such changes in it that the system is henceforth no longer susceptible of its influence.

Under the title, poisoning of the blood, there may be arranged a large and most important class of diseases.

In the first place may come *inorganic* or *mineral poisons*, whether solid, fluid, or gaseous, introduced from without, and passing in through either the digestive or respiratory apparatus. Such, for example, are arsenic, prussic acid, and sulphuretted hydrogen.

Next, of organic poisons are *the vegetable*, introduced from without, and passing in like the former. Such, for example, are strychnia and ipecacuanha.

The action of these is, as the rule, in proportion to the dose.

Then of organic poisons are the *animal*. These may be introduced from without, and pass in through the stomach as the flesh of animals under certain conditions.

Or they may be introduced—as they usually are—through wounds or abrasions, or perhaps through mucous membrane, or even sound skin; as the poison of dissection-wounds; of serpents and insects; of gonorrhœa and syphilis.

Of these poisons, some have both a peculiar local and a constitutional action: as the poison of syphilis, and that which produces the so-called malignant pustule.

Some organic poisons, whether they be classified as vegetable or animal, which are introduced from without, after passing in, perhaps usually through

the respiratory apparatus, are capable of reproduction in the blood, having a period of incubation; as the poisons of zymotic diseases.

But animal poisons may be formed within the body itself, and pass into the blood: as that which produces pyæmia.

The symptoms of pyæmia may be thus enumerated:—It is generally ushered in by rigors, which are perhaps frequently repeated and sometimes severe. These are followed, often almost immediately, by profuse sweating and a very rapid pulse. Sometimes there is rather sudden and considerable increase of temperature. Then come restlessness, anxiety, depression of spirits, and marked failure of power. There is often a sense of weight at the præcordia, with frequent hiccough, sighing, and perhaps moaning. The pulse increases in rapidity, and at the same time becomes small and feeble, and the breathing hurried and oppressed. The patient lies bathed in perspiration, which is sometimes accompanied by miliary vesicles scattered over the chest and adjacent parts. The temperature of the surface varies much from time to time. The skin is at first sallow, and gradually becomes yellow. The urine is scanty and high-colored. The tongue for a time may remain clean, but is usually from the first tremulous. There are often, soon after, vomiting and perhaps diarrhœa; occasionally hemorrhage from the bowels. Then the general restlessness and deep anxiety, expressed in the pinched and haggard countenance, increase. The aspect is sometimes wild, oftener dull, vacant, and impassive. As the disease advances, the patient becomes incoherent, and there is low muttering delirium, but from this, at first, he rallies when addressed. The prostration grows extreme. The features become more shrunken; the skin more yellow. Pustules or petechiæ, or patches of congestion or of erratic erysipelas, sometimes appear. Often, too, a peculiar odour is exhaled from the body. There is a running, flickering, or imperceptible pulse; a dry, brown, or black tongue, with sordes on the lips and gums; often subsultus tendinum, and then death.

Coincidently with the advent of the general symptoms, the character of the wound, if there be one, often suddenly changes. The healing process is abruptly stopped. The surface becomes pale and glazed, the granulations shrink and become dry, the soft part flaccid, and the discharge almost ceases, or becomes thin, watery, sanious, or fetid.

These changes are very soon followed by other local symptoms. Usually the best marked are sudden tenderness, with very rapid swelling of one or two or more, or sometimes of most of the joints, soon followed by a blush over the surface. Before long there is clear evidence of distinct collections of fluid. Pus, under these circumstances, is usually poured forth into the joints with extraordinary rapidity, and although this is often accompanied with much local distress, yet not unfrequently it will accumulate so insidiously that its presence, especially in the deeper joints, is not suspected during life. But although it very commonly happens in the case of the joints which are deeply placed that there are no signs of any local disturbance while they remain quite at rest and are not touched, yet the most acute sensibility will be evinced upon the slightest attempt at motion, or the least pressure.

Such are the symptoms collectively which are usually present in pyæmia, but one or more of them may be absent. Even the rigors may be wanting. But the rigors, the profuse perspiration, the rapid pulse, and the increasing debility quickly running on into extreme exhaustion and collapse, are the salient and characteristic features of pyæmia.

The diagnosis of pyæmia at its outset, after an operation or accident, is often assisted by noting the period after the injury at which the earliest symptoms supervene. Rigors for example, occurring within a very few hours, are not usually so significant of mischief as those which occur after the lapse of a day or two.

[It is only in the worst and most rapidly fatal cases, where there has not been time for the local lesions to appear, that any change in the blood can be detected.]

In these cases the blood is found unnaturally dark and fluid, with few,

large, black, soft, and imperfectly formed clots. Its power of coagulation is evidently much impaired. Such loose clots as are found possess hardly any power of contraction, and the serum which escapes is unnaturally coloured and turbid. This blood very soon becomes putrid. Indeed in extreme cases it may be said to be putrid at the time of death; for, however soon after the body is examined, there is evidence from its odour and the changes which the blood and soft tissues—as the spleen and other viscera, and often the muscles generally—present, of rapidly advancing decomposition. They may truly be described as already rotten.

The local effects may be thus described:—

In various organs, spots and patches of congestion, more or less intense, varying from mere distension of the blood-vessels to complete stagnation. The smaller of these—the spots—are, for the most part, well defined and regular in shape, with usually a circular outline upon section. They are of a dark-red or livid colour, sometimes slightly raised, and often indurated. In the larger patches all these characters are usually less pronounced. The colour is less intense, being generally of a more dusky hue, and less defined.

The exact condition of parts in the spots and blotches which first are formed is an interesting subject of inquiry. The term "ecchymosis" is commonly applied to these spots, but it does not appear that usually there is any evidence of actual rupture or extravasation. A careful examination of these spots with the naked eye and lenses shows that there is intense congestion and even stagnation in the focus of the mischief, with perhaps subsequent coagulation, and staining of the surrounding tissues from exudation of colouring matter; but there is no evidence, except in extreme cases, of actual extravasation of blood. Hence the term ecchymosis, thus applied, is not always strictly correct. The sequence of phenomena sketched above is indeed what might have been expected. One can see no reason why any rupture of the vessels should ordinarily occur.

In the neighbourhood of these congestions, and elsewhere, the organs are often infiltrated with effused serum.

Collections of pus in different stages of formation and change, varying in size from mere purulent points to large abscesses yielding several ounces of pus; sometimes circumscribed and bounded by well-defined walls; at other times so diffused as to appear infiltrated among the tissues.

These secondary abscesses of pyæmia are by no means always simple collections of pure pus. Not only does the pus itself vary in quality and present all degrees of consistency, from a thin sanious fluid, with semi-solid flakes, to a thick uniform glutinous substance, but it is often mingled with more or less lymph, which is either tolerably tough and cohesive, or soft, even fluid, with firmer shreds. At other times the whole collection has the character of softening tubercle. Still more rarely, it is throughout of a rust colour, tinted with blood.

Yet I think there can be little doubt that, as the rule, these purulent collections, when rapidly produced, consist of well-formed pus. For, by its physical and other characters, both to the naked eye and to the microscope, the matter cannot usually be distinguished from that of any ordinary acute abscess. It seems, indeed, as if the character of these collections, in this respect, was mainly influenced by their rate of formation, and the time which subsequently elapses before they are examined.

The relation of the spots and patches of congestion to the abscesses has been clearly shown. They constitute the first stage of the process. Suppuration follows; not always, it is true. The mischief may fall short of this. The morbid process, after reaching a certain point, may recede, and the patch of congestion, or the deep-red or livid spot, instead of passing on into suppuration, may, after remaining for a while, clear up, and gradually disappear. But if they pass on into abscesses, they gradually soften towards the centre, which at the same time becomes paler, until at length a puriform fluid oozes out when a section is compressed. Afterwards there is a distinct collection of pus in the centre, with a halo of livid indurated substance which gradually passes outwards into healthy tissue.

Occasionally, when the local action of the poison seems to have been more intense, the portions of the structure affected do not pass into a state of suppuration, but perish, and patches of gangrenous tissue are found after death. These extreme effects are not very common, and, perhaps, are more often seen in the cellular tissue and in the lungs than elsewhere.

In the same organ, after death, purulent collections in all stages may be seen. Livid or petechial spots, some softening in the centre, others exhibiting well-formed pus there, which is gradually lost as it is traced outward, passing into grey, and then into red, hepatisation, until nothing beyond congestion appears. Or simple collections of pus, with little or no surrounding disturbance, passing insensibly into healthy tissue, or it may be abruptly defined, even encysted. Then these purulent collections become, by-and-by, more concrete at the circumference, while toward the centre they are still fluid. But at length, by inspissation they become caseous throughout, and, if life lasts, they will pass through still further degenerative changes. Thus they may assume the appearance of tubercle.

These local effects of blood-poisoning most commonly occur, and may be most conveniently studied, in the lungs. The lungs are not only, by far, the most frequent seat of these changes, but the lungs are often affected alone. It is a rare exception for them to be free when other organs are affected.

In these organs, purulent collections are usually formed, first at the base, and then proceed upwards, so that the greatest number and the most advanced are found in the lowest lobes. This has been pointed out by Dance as a distinguishing feature between these purulent deposits and tubercles. It has also been remarked that the right lung is oftener affected than the left. Again, in the lungs especially, though to a less degree elsewhere, the abscesses vary greatly in size and number; in some cases being large and few, in others small and numerous.

Sometimes, however, these secondary abscesses occur in the liver, when none are found in the lungs or elsewhere, and these exceptional cases almost always admit of a satisfactory explanation. For the poison has been absorbed by the tributaries of the portal vein, and then arrested in the capillaries of the liver through which it must first pass.

However, it would appear that cases occur in which, while the lungs have escaped, the liver has been affected under circumstances which do not admit of so simple an explanation.

One of the preparations (18°43) in the Museum of St. Bartholomew's Hospital, is thus described:—

"Portion of liver from a man who died five days after amputation of the thigh for disease of the right knee-joint. The parts divided were undermined by old suppurating sinuses; and the long saphena vein, where divided, was full of dark clots. Before death the opposite limb became œdematous, and its superficial veins hard and cord-like. The deeper veins generally were blood-stained, and their contents fluid. There were remains of an old clot at the junction of the femoral and profunda on the left side; but they were softened and broken down, apparently from decomposition, not by the process of disintegration which sometimes occurs during life.

"The liver was pale and rotten, and the hepatic veins distended. The thin margin of the liver was dotted with small ecchymoses, showing through the peritoneum. The spots in some places appeared to be certainly extravasations, in others only patches of loaded vessels.

"There were no morbid appearances in the lungs or pleuræ. But there were spots of ecchymosis on the heart, with bloody fluid in the pericardium."

But with the lungs, the liver, spleen, kidneys, alimentary canal, heart, muscles, joints, cellular tissue generally, and other structures, are very often affected.

Every surgeon knows that, in almost every case of well-marked pyæmia, one or two or more of the joints are the seat of purulent collections. Indeed, this affection of the joints is usually, during life, the most striking and distressing of the local effects. It is astonishing with what rapidity pus will

often be poured forth into a joint under these circumstances, and it not unfrequently happens, when, after death, the joint is carefully examined, a large quantity of pus having been washed out, that only very slight traces of any morbid action can be discovered. Here and there perhaps may be discerned some increased vascularity, and probably some thickening, but the synovial membrane, although it may be somewhat pulpy, will be entire, and no amount of mischief can be detected apparently commensurate with the large quantity of matter which has been formed. But in some cases the tissues of the joints—the synovial membrane and cartilage—will be extensively disorganised. It will be obvious that they were being very rapidly destroyed. It does not follow, however, that every joint which is swollen and seems to fluctuate contains pus. Perhaps nothing beyond some slight increase of vascularity and infiltration of serum can be detected.

Lastly, it may be observed that these purulent collections and the accompanying mischief are by no means confined to the joints proper. They are often discovered in neighbouring structures, such as the sheaths of tendons.

I think it has been shown elsewhere that the local effects of pyæmia may be produced by the introduction into the blood of—

Minute particles of solid matter—such as disintegrated fibrine.

Putrid fluids which contain no solid particles.

Pus.

That in either case the immediate local effects are essentially the some. The most critical examination fails to detect any distinction in the engorged portions of tissue produced by these different means, except that when solid particles, which undergo no change, are employed, they may be discovered in the midst.

The action of fresh pus in producing these effects is mechanical. Either its cells, or the clots which it may form in the blood, become impacted in the capillaries. When putrid no doubt it acts in both modes.

Pus, then, has no peculiar or specific action when present in the blood. If putrid, it will act like putrid matters generally do; or its globules may, under certain circumstances, like other foreign particles, become arrested in and block up the capillaries, producing effects already described.

The clinical relation of pus to the production of pyæmia appears to be this:—

Suppuration is a common occurrence, either on the surface of wounds or ulcers, or in internal parts.

Pus, as pus, cannot be absorbed; that is, its solid particles, its corpuscles, cannot enter the circulation, except through some lesion of the blood-vessels. Pus may pass into the circulation through an orifice in a vein: this occurrence, however, must be extremely rare. But the fluid part of pus may be absorbed. If this be not putrid no mischief will supervene.

Even if healthy pus should, by some rare chance, find its way into the circulation, no secondary abscesses would perhaps be, under ordinary circumstances, produced. For healthy pus may be, very often has been, injected into the circulation, without being followed by any purulent deposit whatever. None of the effects which are ascribed to pyæmia are necessarily produced by the injection of healthy pus.

But pus may become putrid, more especially if exposed to air in a wound, and the putrid fluid may be absorbed; and this, like any other putrid fluid, will produce the effects to which the term pyæmia is applied. It will poison the blood. For when putrid pus is injected, the symptoms of blood-poisoning, as after the injection of any putrid matter, will supervene.

It is undoubtedly a rare circumstance to find a case of well-marked and fully developed pyæmia without any evidence of the previous existence of pus in some part of the body. The previous existence of an external wound, indeed, is by no means necessary to the development of pyæmia. In children, on the contrary, it is perhaps most frequently seen in connexion with acute necrosis. But suppuration occurs in these cases.

Now one of the chief arguments of those who affirm that the passage of

pus into the blood is the sole cause of pyæmia is drawn from the assumed fact of the constant pre-existence of a local suppuration. But the fact that pyæmia is so commonly preceded by the formation of pus admits of another which I believe is the correct interpretation.

Pyæmia is due to the absorption of a putrid or morbid fluid. But such a fluid is hardly ever, can hardly ever be, poured out except under the circumstances in which pus will be formed. Nay, more; no doubt this morbid poisonous fluid is often the changed or partially decomposed fluid of pus. The conditions under which suppuration occurs are almost always the conditions under which a putrid fluid will be formed and can be absorbed. Admitting fully, however, this relation of pus to pyæmia, it is nevertheless to be understood that there is nothing peculiar to pus upon which the production of pyæmia depends.

When one reflects upon the subject, it is not perhaps so difficult as at first sight it may appear to be to account for the fact that the same effects are produced by such different agents as poisonous fluids and passive particles of solid matter.

To take the second case first. It cannot be doubted that these minute particles act mechanically only, at least at the outset, by blocking up capillary vessels, and so inducing stagnation and congestion, which gradually spread; the farther consequences being determined by other circumstances, such as the extent of irritation thus set up, and the constitution and state of health of the subject.

In the first case also, stagnation is likewise induced, but by a different process. It is essential to a free capillary circulation that the changes between the blood and the tissues which there occur should proceed in a normal manner. It has been shown that whatever interferes with those mutual changes constitutes an impediment to the capillary circulation. Hence, then, the congestion and stagnation, more or less extensive and widely spreading, which ensue upon, or can be induced at pleasure by, the introduction of morbid matters into the blood. These may be altogether in the fluid form, yet, mingling with the blood, they must affect profoundly its constitution, and consequently the relation which it will hold to the tissues through which it circulates. Healthy nutrition is checked, the normal changes are obstructed, and, therefore, the capillary circulation is no longer free. The transmission of blood through the capillaries being hindered, it there accumulates, and at length stagnates. Thus obstruction to the circulation of the blood through the capillaries is the common condition arrived at in either case.

It is a significant fact that these different agents not only produce the same result, but affect principally and particularly the same organs—the lungs. In the case of solid particles, which obviously act by blocking up the capillaries, the lungs are the sole or chief seat of the mischief, by virtue of their position—their capillaries being the first that the blood reaches after its contamination,—their vascularity, and the minuteness of their capillary network. What other explanation, in the case of morbid fluids, can be offered of the fact, that here also the stress of mischief falls upon the lungs, than that the cause of it is likewise lodged in the pulmonary capillaries? In either case the organs beyond are more or less protected by the total or partial arrest of the mischievous matter in the lungs.

It may, perhaps, be said that, generally speaking, the spots of stagnation and congestion produced by the injection of solid particles are smaller and more regular in outline than the patches produced by the injection of poisonous fluids. This variation, which constitutes of course no essential distinction, may be due to the fact that a fluid is more readily and widely diffused through portions of the blood than are solid particles.

It must be observed that the effects produced by the introduction of different matters into the blood is by no means uniform. They may differ widely. Thus, after the mingling of certain poisonous substances with the blood, instead of suppuration, gangrene of the lungs and other organs may be produced. This fact seems to be well established both by experiment

and by observation. But does this result—gangrene—represent a difference of kind, or only of degree? Are suppuration and gangrene—to take these striking results—distinct effects of different poisons?—or, are they only different degrees of morbid action, determined by the intensity or quantity of the poison operating, and the condition of the system? All I can say is this: that the evidence before us does not warrant the conclusion that these effects are due to the action of different poisons.

The causes of the local congestions and suppurations in pyæmia may, therefore, be thus classified:—

Stasis due to mechanical action: a blockade produced by the impaction of solid particles. According to their size—

Arterial embolism: by fragments too large to pass through the smaller arteries.

Capillary embolism: by fragments small enough to pass into the capillaries.

Stasis due to change in the blood produced by the admixture of morbid fluid: the local effect of blood-poisoning properly so called—

Capillary obstruction.

Stasis due to a combination of the two above-mentioned causes.

In all cases stagnation and congestion first ensue. The subsequent changes, whether towards resolution, suppuration, or gangrene, are determined by—

The action of the morbid fluid or obstructing substance. The changes it provokes.

The constitution and state of health of the individual.

Although the local lesions produced by blood-poisoning are the most striking of its phenomena, they cannot be considered to constitute the gravest effects of the disease. In truth they are but the secondary effects of it, and it is because of this poisoning and spoiling of the blood in the more acute or intense form of the affection that pyæmia is so fatal. For the worst cases—those in which death is most rapid—reveal afterwards the least signs of local disease. Indeed, in the very worst cases there has been no time for local mischief to supervene. The whole mass of the blood is so poisoned and spoiled that it kills outright. It is in the milder cases only that the local effects have time to develope, and to pass through their subsequent changes. Thus, although the local effects of putrid fluids and solid particles are essentially the same and produced in the same way, it must ever be borne in mind that in the case of putrid infection there is added to these the more terrible result of universal poisoning of the blood. And, in truth, it would be difficult to suggest any subject more worthy of study than the influence which this poisoning of the blood has upon the local lesions in determining the changes they subsequently undergo.

That the poison still continues active in the blood is conclusively shown, not only by the altered characters it presents after death, which have been already alluded to, but also by experiment. For example: Gaspard, having injected much putrid matter, which destroyed a dog, drew some blood from its uninjured jugular vein, which was without any putrid odour. It was defibrinated, passed through linen, and then four ounces and a half were injected lukewarm into the jugular vein of another very vigorous dog. The injection was followed by the usual symptoms of blood-poisoning, although the dog recovered, after vomiting and purging. After relating this experiment, Gaspard says: "It is certain then that putrid substances injected into the veins affect the general mass of the blood, notwithstanding their successive passage and their filtration through the two systems of the lungs and other organs." "It is evident that putrid liquids injected by the jugular circulate through the whole body, and are not arrested in the capillaries like mercury, fat, oil, viscid substances and powders, or any others too coarse."

Nevertheless, although the poison partly passes through, it produces obstruction in the capillaries; for in the dog, from which the poisonous blood had been drawn, petechial spots were found after death in the lungs and left ventricle of the heart, considerable ecchymoses in the cellular tissue around

the thoracic aorta, in the mesenteric glands and gall-bladder, and something like inflammation of the mucous membrane of the intestines.

Again, Leuret, many years ago, produced the disease called *charbon* in healthy horses—

By placing under the skin of the neck blood taken from the heart after death of a horse with the disease.

By injecting into the jugular vein of a healthy horse some blood taken immediately after death from the right auricle of a horse with the disease.

And, lastly, by causing the blood to flow from the jugular vein of a living horse affected with charbon into the jugular vein of a healthy mare, by establishing a double communication between these vessels. In this experiment all the symptoms and effects of the disease were after a while established in the healthy animal, which died seven days after the operation.

It is well known that remarkable evidence to the same effect has been furnished by experiments on the cattle plague.

So the poison can be transmitted directly by the blood either of the dead or living animal; and thus, while the introduction of solid particles into the blood produces only local effects—arterial or capillary embolism and their consequences,—the introduction of putrid fluid poisons, and so spoils, the whole mass of the blood, of which the local lesions—capillary obstruction—appear as secondary effects.

It has been shown that the local effects of pyæmia may be produced by the passage into the blood of either solid particles or putrid fluids. But although it may be easily imagined that even solid particles, circulating with the blood and blocking up the vessels, may produce, under certain circumstances, considerable constitutional disturbance, yet there is no evidence that such severe symptoms as mark the advent and course of acute pyæmia could be produced by foreign particles that act mechanically only. These effects must be ascribed to the introduction of putrid fluids which poison the blood. Therefore while, as a rule, cases of simple embolism must be referred to the action of solid particles, the terrible disease known as pyæmia must be due to the action of some putrid fluid poisoning the blood.

Now, whenever such a fluid exists in contact with any surface capable of absorption, there is more or less risk of infection of the blood. Such a fluid is usually produced at the surface of wounds, whether the result of accident or operation, and is usually, of course, the decomposing liquor of pus—hence the assumed specific relation of pus to pyæmia. That some wounds are more likely to become the source of blood-poisoning than others can be readily understood. For instance, it has been observed that, comparatively speaking, pyæmia seldom supervenes upon superficial injuries during the process of healing, or after wounds resulting from simple operations, as removal of the breast or herniotomy. But although, unhappily, there is no form of wound, however superficial or simple, which has not, within the experience of most surgeons, proved the source of blood-poisoning, yet, as the rule, it may be affirmed that wounds are dangerous in this respect in proportion as the pus or other fluid they furnish is allowed to accumulate and to be retained until it becomes decomposed. Hence deep and depending wounds, which furnish foul discharges that cannot easily escape, are the wounds which are reasonably regarded with most apprehension, and the condition of which surgeons are most anxious to alter.

But pyæmia may, and too often does, occur independently of any external wound or exposed surface whatever, and I think the experience of surgeons will bear me out in stating that, under these circumstances, it is far more frequently seen following upon acute necrosis than upon any other malady. So often, indeed, are cases of acute necrosis of the shaft of the long bones in children terminated in this way that the probability of the event should always become a chief consideration in deciding upon the treatment of such cases. It has been remarked that acute diffused inflammation of the cellular tissue, as that of a limb, amongst the muscles and surrounding the bone, is a very frequent source of pyæmia; but the more I see the more I am convinced that the majority, at least, of such cases are essentially cases of acute necro-

sis of the bone, the surrounding mischief being secondary to or associated with this. But in such cases pus is almost always formed before death. And while it is generally admitted—as, indeed, these striking cases prove—that pyæmia may arise independently of any external wound or exposed surface, it is not commonly admitted, I believe, that pyæmia may occur without the presence of pus somewhere.

I have already endeavoured to account for the common association of pus and pyæmia, without admitting any specific relation whatever between them as cause and effect.

Pyæmia then is the result of the contamination of the blood by the admixture of some putrid or decomposing fluid, the effects of which must vary according to—

The intensity of the poison.
The quantity introduced.
The rate of its absorption.

But if pyæmia be thus caused by the circulation of morbid matter with the blood, how comes it, considering the absorbing power of raw surfaces, and the frequency with which wounds are bathed in fetid fluids, that pyæmia is not even much more common than it is? Why, in the case of every putrid collection in contact with living parts, is there not infection? The apparent discrepancy between cause and effect, in this regard, disappears when the circumstances which affect absorption are taken into account. Since the time when the mingling of fluids through animal membranes was demonstrated much has been added to our knowledge of the subject. Especially have the conditions which influence the transmission of fluids been studied both in relation to the fluids themselves and the membranes through which they pass. Absorption, or the transmission of fluids through membranes, no longer appears the simple process it was formerly supposed to be. Not only is it much modified, according to the nature and surface of the tissue, but also by the character and composition of the fluid. It has been shown that the constituents of a fluid, apparently uniform, may be thus separated by a membrane through which one can and the other cannot pass; and that in this there is a means of analysis more subtle than the chemist can accomplish. Moreover, it is probable that absorption of poisonous matters, even when it does occur, may be sometimes so gradual as not to exceed the rate of elimination, and therefore not to accumulate in the blood to an extent sufficient to produce obvious results. The results, that is, which we recognise as pyæmia; but, as before suggested, the milder degrees of blood-poisoning are probably far more common than is generally imagined, because the slight and transient disturbances which they evoke are either otherwise accounted for or overlooked. When all this is considered in relation to the absorption of poisonous fluids the objection just now alluded to loses all its weight. Unhappily, pyæmia is of no rare occurrence; but it would be far more frequent than it is if there were no difficulty in the way of absorption of putrid fluids from raw surfaces.

There can be no doubt that different persons are differently disposed to be affected by a poison mingling with the blood. Indeed, this fact has become familiar to us by repeated illustrations. For instance, how very few out of the many who receive dissection wounds suffer therefrom. There can be no question, I think, that here a poison is very often introduced without any appreciable effect upon the system—a poison which at times is potent to imperil or destroy life. That it is the same poison which in different individuals produces such different results is shown by the fact which has repeatedly occurred, that while two or three persons have been fairly inoculated from the same subject, yet only one has suffered. Again, after the poison has been introduced, it may be eliminated more freely in one than in another: and even while circulating it may tell with very varying effect upon the blood and tissues in different cases. Thus the predisposition to be affected by a putrid poison varies in different individuals, and the conditions which determine such difference may be in some measure guessed at.

Among the predisposing causes, then, of blood-poisoning may be suggested—

All causes which reduce the vital powers, such as previous disease. Our ideas on this subject are of necessity at present vague and obscure, but all that we know tends to assure us that, as the powers are reduced, less resistance is offered to the influence of poisons of all kinds; and we can very easily imagine that when the forces by which the blood maintains uniformly its normal condition in spite of the countless disturbing influences to which it is exposed—that when these forces are enfeebled, it yields more easily to the destructive influence of an animal poison.

I think in these and other cases we are prone to confound the vital forces in general with mere muscular power, or what is commonly called bodily strength. But every one is aware that it by no means follows because an individual is what is called strong that therefore he is healthy. The delicate will often resist or recover from morbid influences to which the robust will succumb. It is necessary to distinguish between health and strength.

Again, among such predisposing causes may, I think, be mentioned any cause which interferes with the due elimination of refuse-matters, whereby there is an undue accumulation of substances in a state of retrograde metamorphosis in the blood. There is, I think, ample evidence to show that these substances especially are of unstable equilibrium and prone to change; and it is not unreasonable to believe that a decomposing substance introduced into the blood may give a different and abnormal direction to these matters, which, being already in a state of retrograde metamorphosis, are probably least able to resist its influence.

On this subject Gaspard has forcibly commented. He says: "In truth, it has been much doubted in recent times that putrefaction can commence in the economy during actual life. But those who have entertained these doubts have never observed with what promptitude our fluids and solids decompose when they cease to be renewed by proper food and drink, or when they are deteriorated by foreign substances. They have never paid attention to the odour, already putrid, of the breath of a man when he awakes after passing a single night in abstinence and repose; or of those who fast for religion; of those who endure hunger for several days; of those who become scorbutic from subsisting upon tainted provisions; of any one under the influence of mercury for syphilis; of a dog fed upon flesh, compared with one fed upon vegetable food, &c. They have never compared the odour of the urine of carnivorous and herbivorous animals," &c. He adds in a note: "In all these cases, it is by the breath that putrid degeneration is especially manifested, because the pulmonary transpiration is the great emunctory of the economy, as Magendie has shown by his experiments with camphor and phosphorus. One knows also that after an excess of spirituous drinks the breath acquires a vinous or alcoholic odour.

The blood is always receiving the products of the retrograde metamorphosis of the tissues—substances which are especially prone to change, and therefore most susceptible of external influence. Now, that these substances are carried through their changes and eliminated at different rates in different persons we can hardly doubt; and I have often fancied that the different susceptibility of different individuals to the action of animal poisons, as those of fevers, may be in some way connected with the amount to, and condition in, which these products are allowed to accumulate in the blood. Are they not, of all substances in the blood, the most likely to be the soil in which the poison germinates, or those upon which it can most readily operate?

There is a condition which has been termed the putrid diathesis, indicated by such symptoms as foul breath, soft, spongy, tumid, easily bleeding gums, &c.,—a condition which seems to be much favoured by a high external temperature.

Is it not a remarkable fact that damaged kidneys have, as the rule, much more influence upon the result of an operation or injury than a damaged heart, although the action of the kidneys is not so immediately necessary to

life as that of the heart? Is not this because the kidneys are called upon to accomplish extra work in excretion and purification of the blood at a time when they are unequal to even the ordinary duties of their office?

Concerning the duration of pyæmia, Sedillot says: "The mean duration of pyæmia terminated by death has been from four to eight days, according to our observations." But he continues: "From another series of facts I have assigned a little longer time for the duration of this affection, and I have fixed the period of death between the eighth and twelfth day." Erichsen writes: "Death usually takes place about the tenth or twelfth day; though it may occur as early as the fourth, or the patient may linger on for six or seven weeks." Probably these statements are as accurate as any that could be furnished on the subject.

The prognosis in this affection is not encouraging. Of all diseases which the surgeon has to encounter, pyæmia is the most destructive and the worst. When it occurs, recovery is comparatively so rare, and it does occur so frequently, it is often so sudden and unexpected in its onset, often so insidious in its progress, and often kills so rapidly, that it is justly regarded by surgeons as the most mischievous of evils. It very often defies all efforts of prevention, and seems hardly ever to be influenced by any attempt to cure. Seldom giving any warning of its approach, it will at once convert a case, which just before seemed full of promise, into one past all hope of recovery; for it cannot be denied that, with rare exceptions, to pronounce a patient the subject of pyæmia is to say that he is a doomed man.

The prognosis in pyæmia may be said to be unfavourable in proportion to the rapidity with which its effects are developed. In acute and well-marked pyæmia, one can hardly venture to admit a ray of hope. On the other hand, as a general rule, the longer the patient can struggle against the mischief the more hope is there of his being ultimately rescued from the perils through which he has to pass. In the more intense forms of this affection the duration of life can be measured only by days or hours. In the milder forms, as the patient survives week after week, hope gains ascendancy. Yet there are exceptions on either side. Sometimes—too often unhappily—even in the most chronic cases, the sufferer lingers on only to sink at last through extreme exhaustion.

[We know of no drug in the whole of the Materia Medica that can be in the least degree depended on to control, much less to cure pyæmia, and yet it is not too much to say that even from this terrible affection many lives have been rescued by careful and skilful management. The great question which is ever before us throughout the case concerns the support of the patient—the use of food and stimulants.]

With regard to stimulants judgment is required. They are almost invariably necessary throughout the case, and the extent to which, at any period, they should be given is one of the nicest questions which can be submitted to us. There is, in truth, scope here for the exercise of all the skill of the most accomplished surgeon, and it must be confessed that it is a matter in which his judgment often appears to considerable disadvantage in comparison with that of a good nurse. When food cannot be taken we are obliged to fall back upon stimulants, and as weakness increases we are often compelled to support life by stimulants alone: but I think, as a rule, it may be said that we should be more jealous in the use of them. They are such potent agents, and so valuable, that we should not be careless of their profuse expenditure. If we are lavish of them at first, they may the sooner fail us afterwards, when life more immediately hangs upon the effects they produce. But again: it is necessary to observe that in these urgent cases we must not be hypercritical of the presumed contraindications to their use. While we are discussing whether the state of the skin or the temperature of the surface will admit of their administration or increase, the patient may die. In such cases I confess to be guided rather by the general condition than by this or that particular symptom.

Of all stimulants brandy is the best. Other stimulants will often prove useful in particular cases, or because of some other mode of action, especially

carbonate of ammonia; but as strong stimulants least likely to disagree, the pure spirits, and, above all, brandy, are the best. As the patient recovers, and the active symptoms subside, wine is better borne, and will often replace brandy, either partly or wholly, with advantage. Of wines, good champagne, iced, is often most grateful, even from the commencement, especially when the stomach is irritable. Brandy and iced champagne, either alternately or mixed together, will often remain on the stomach, and prove agreeable when every thing else is rejected.

When there is much sickness or irritability of the stomach, with a parched mouth, and fever, as a rule, nothing will be so refreshing to the patient as pieces of ice allowed to dissolve in the mouth. It is almost the only thing I have heard eagerly asked for during the progress of the affection.

If we do not neglect these grand indications, I can see no objection to the employment of particular drugs, which may reasonably be supposed to possess a suitable action, provided always they do not disagree. We have evidence for the belief that we have to contend against the operation of a morbid poison, of a putrid fluid in the blood. Now we may conceive that its mischievous effects may be averted, either by its elimination, by an arrest of the changes it provokes, or by destroying its deleterious properties by rapid oxidation.

Its elimination through the various excretions seems to me the most natural method. It is the one most obviously adopted by nature, and which, as already said, we may fairly attempt to assist by the use of those drugs which encourage the secretions.

Gaspard observes that the liver appears to serve as the chief emunctory of the body. He points out how often, in the natural cure of certain affections, there occur spontaneous and abundant evacuations, which are critical, of evidently altered bile. He alludes to the frequent connexion which has been pointed out between putrid and bilious affections; and he says, and appeals to his own experience in support of the fact, that the poison of vipers and of other serpents, when introduced into the blood, disturbs, in the first instance, the liver, and augments enormously its secretion. Then he says, after removal of the kidneys, in the experiments of Comhaire and of Prevost and Dumas, when urea and other principles of the urine, more or less putrid, accumulate in the blood, the biliary secretion is much increased; and in many of his experiments he has seen putrid substances injected into the veins act certainly upon the liver and the bile. These, and other facts which he brings forward, all concur to prove, he says, "that bilious affections are the first degree of putrid affections."

Those agents which arrest the decomposition of animal matters are termed antiseptics, and there are many substances which are very efficient in this respect. It is well known that flesh and blood, and animal matters of all kinds, may be preserved in these for an indefinite period without becoming putrid, or evincing any signs of decomposition. No wonder, then, that these agents have been largely employed in the treatment of a disease which is supposed to depend upon the presence of a putrid fluid in the blood. But, unfortunately, evidence is wanting to show that effects which are produced in the laboratory are produced in the blood as it circulates during life, or that preservatives of dead flesh are necessarily preservatives of living tissues. That we can prevent the decomposition of blood in a bottle, or destroy its putridity, by mixing it with an antiseptic, affords nothing like proof that the same substance, if mingling with the blood as it circulates, will arrest the changes which a putrid fluid may set up. Still their employment cannot be said to be altogether unreasonable, and if future experience should show that they sometimes prove useful, we have, I think, a better clue to their mode of action than to that of many other drugs which justly claim a large share of our confidence.

Amongst drugs which are believed to act in this way the claims of sulphurous acid have been strongly urged by Dr. Polli. He has come to the conclusion that not only it alone, but also its combinations with earths and alkalies, such as the sulphites of soda, potassa, magnesia, and lime—which

can be borne in large doses—possess in a supreme degree the power of arresting all known organic fermentations and putrefactive metamorphoses of animal solids and liquids, and that its action is such that it never proves a poison to the living organism, as do many other substances well known for their antiseptic properties, but which, on account of their poisonous effects, cannot be employed with safety.

In a very interesting and instructive Report on the Surgery of the late War in America, which has been just issued from the Surgeon-General's office, it is stated of pyæmia: "It has been one of the great sources of mortality after amputations, and its victims are to be counted by thousands. . . Several valuable papers have been contributed on the pathology of this affection, and a number of statistical reports on its treatment. The conclusions of the latter are adverse to the therapeutical utility of the sulphites and hyposulphites in this disease."

There remains the fact that the mischievous properties of putrid substances may be destroyed by rapid oxidation. It has been clearly shown, for instance, that the efficacy of charcoal in counteracting putridity is not due to any power of arresting change, but to its power of promoting oxidation. Now, amongst agents of this class, the alkalies occupy a conspicuous place. Liebig says (and in justice to the argument I cannot venture to omit any portion of the following extract): "A number of organic compounds acquire, by contact with or in presence of a free alkali, the power of combining with oxygen (of burning), which, alone, they do not at all possess at the ordinary temperature of the air, or at the temperature of the body (Chevreul). The influence of alkalies in this way is most strikingly seen in such substances as are coloured, and become decolorised under these circumstances, or in such as are colourless, and become coloured as they are destroyed. Carmine, the most durable organic colouring matter known to us, the colouring matters of logwood and Brazil wood, and *the colouring matter of the blood*, dissolve in solution of potash, and may be preserved for months unchanged; but as soon as air or oxygen is admitted to these solutions oxygen is rapidly absorbed, and these colouring matters are destroyed (Chevreul).

"The colourless solution of pyrogallic acid, or that of gallic acid, when mixed with excess of alkali, becomes, when oxygen is admitted, dark red, and is destroyed in a few minutes. Even alcohol is oxidised when it contains free alkali and is exposed to air at the ordinary temperature, and becomes brown.

"Milk sugar and grape sugar, in presence of a free alkali, and with the aid of a gentle heat, deprive even metallic oxides of their oxygen."

And, what is more important, there is good evidence to show that this action proceeds in the blood. Liebig continues:—

"The alkalies exert a precisely similar action in the blood; they promote and increase the combustibility of the respiratory matters.

"This influence of the alkalies is shown in a decisive manner in the effects produced on the salts of organic acid in the circulation. It has long been observed that after eating juicy fruits, cherries, strawberries, apples, &c., the urine becomes alkaline. All these fruits, as well as the juices of edible roots, tubers, and green vegetables, contain these alkalies in the form of salts of the organic acids; usually as malates (all kernel fruits, pine apples), citrates (stone fruits, currants, potatoes), tartrates (grapes). It has been shown by Gilbert Blane and by Wöhler that the pure salts, malates, citrates, tartrates, &c., of the alkalies, when taken internally behave exactly as the salts in the juices of these fruits and roots. Citrate, tartrate, malate, and acetate of potash, whether given by the mouth or in enemata, appear in the urine in the form of carbonate of potash.

"The acids of these salts, introduced into the blood in the form of neutral or acid salts, are there burned (oxidised) as effectually as in the most perfect apparatus of combustion. The alkaline carbonates which predominate in the urine of herbivorous animals are derived from the same source—namely, from the salts composed of the alkalies with the organic acids contained in the fodder.

"In precisely the same way is uric acid destroyed or burnt in the organism in presence of free alkali. In the urine of rabbits to which had been given proportionally large doses of uric acid, in the form of urate of potash (2 to 2½ grammes—30 to 40 grains), no uric acid could be detected. It had been converted into oxalic acid and urea, the amount of which last in the urine exceeded the normal quantity at least five-fold (Frerichs). But, as is well known, urea corresponds in composition to carbonic acid. It is carbonic acid in which half of the oxygen is represented and replaced by its equivalent of amide (NH_2).

"The causes of the so greatly increased combustibility of all these bodies is evidently—as is proved by the most obvious considerations—the alkaline quality of the blood.

"The herbivora consume in their fodder a quantity of vegetable acids in the free or uncombined state, which, like the portion combined with alkaline bases, are destroyed, and disappear in the circulation (the blood being always alkaline, so that these free acids are also converted into alkaline salts). It can hardly be doubted that, in the organism of the harbivora, exactly as in that of the carnivora, uric acid must be formed as an imperfect or intermediate product of the combustion of the plastic matters consumed in the change of matter; but in the normal, healthy state, this uric acid never appears in their urine, rich as it is in free alkali.

"This fact is satisfactorily explained by the presence of alkaline carbonates in their blood.

"The vegetable acids, when they enter the blood, or the uric acid formed in the body, decompose the alkaline carbonates in the blood, and form neutral salts, which are destroyed as fast as they are formed by the oxygen present in the blood. The carbonic acid, thus set free, is given off by the lungs.

"The same organic acids which, in the form of salts—that is, *accompanied by alkaline bases*, disappear so rapidly even in the blood of man, appear in great part unchanged in the urine when they are taken *without these alkalies*. Even the most combustible of them, such as tartaric and gallic acids, become, in these circumstances, incombustible in the blood of man. Gallic acid is particularly easy to be recognized in the urine by its property of striking an inky black with the salts of sesquioxide of iron.

"The cause of this incombustibility is the want of the *free alkali which determines and promotes the action of the oxygen*."

Dr. Bence Jones says: "Alkalies assist in the oxidation of organic substances, not by giving oxygen, but by promoting the formation of vegetable and animal acids, and ultimately forming carbonates out of the burning matter. Familiar instances are the saponification of fats, the use of caustic potash in Trommer's test for sugar, the use of lime in Moore's test, the use of potash in Liebig's method of determining the amount of oxygen gas by pyrogallic acid.

"Hence caustic alkalies, potass, soda, magnesia, are more efficacious as oxidisers than carbonates, and carbonates more potent than bicarbonates. But even bicarbonates, when heated with organic substances, lead to the formation of organic acids, which displace the carbonic acid, and thus promote the oxidising action."

Now the employment of the alkalies in the treatment of blood-poisoning is not only thus rendered most reasonable, but experience seems to bear testimony in their favour. It behoves us to draw conclusions—nay, even to receive impressions, with all caution concerning the efficacy of any plan of treatment; but I have been led to believe that in some cases the employment of the alkaline salts, such as the bicarbonate of potassa, has proved of service; nor do I think that I am alone in this opinion. I cannot speak so confidently of their value in acute pyæmia, where the progress of affection is so fearfully rapid; but in the slower and milder forms of the disease they are often evidently beneficial. I am sure I have frequently seen the condition of a patient improve during their use. Moreover, there is the testimony of others in their favour. Of their beneficial action in many affections which seem to depend upon the milder action of some poisonous organic

matters in the blood I cannot entertain a doubt, any more than of their local action in the case of poisoned wounds, as those of the wasp and viper.

I have previously alluded to the idea that the products of the retrograde metamorphosis of the tissues, which the blood is constantly receiving, may be, from their very nature, the matters upon which the poison can most readily operate. Be this as it may, these substances should be completely changed and freely eliminated. In a state of perfect health they are fully and freely oxidised. And, in some instances, when this action is impeded or arrested, we can in some measure appreciate the result, as, for example, in what is called the uric-acid diathesis.

Now, I think it has been shown that alkalies promote these changes, and in this way, apart from whatever direct action they may exercise upon the poison itself, they may assist us in our management of pyæmia.

It may be said that all this is simple speculation. Granted to a great extent for some portion of the argument. But is it unreasonable? And if not, do not alkalies, under the circumstances, deserve a fair trial?

Their employment is not likely to do mischief. When given for some time they are believed to depress. I venture to think their action in this respect has been exaggerated. Perhaps it is more true of the simple alkalies, as liquor potassæ, than of their bicarbonates. For this reason I have usually chosen the bicarconate of potassa, often combining it with the carbonate of ammonia. For the greater power which the simple alkali may possess over the carbonate as an oxidiser, is, I think, more than outweighed by the larger doses, which are better borne, of the latter.

With the same sort of view many drugs have been given rich in oxygen under the idea that they may furnish this element to the blood. But it need hardly be said that this idea, which has arisen out of a misconception, is for the most part purely visionary. In the first place, it has not been shown that these compounds yield free oxygen by decomposition in the blood, and even if they were so decomposed the amount of oxygen they could furnish would be trifling in comparison to that always taken in by respiration; while any extraordinary influence which it could exercise by virtue of its peculiar condition is a matter of mere speculation.

When the more active effects of the poison have passed away, and the patient is left in an exhausted state, iron will often prove a very valuable remedy. It seems to be especially required in this condition of anæmia and debility, in which, perhaps, traces of the poison still linger in the system. It promotes the formation of blood-cells, and thus becomes indirectly an oxidiser by its power of drawing oxygen into the blood. There is a large choice of various salts of iron, and some of these may often, with advantage, be given with an alkali.

Both in hospital and private practice cases of pyæmia still from time to time occur in spite of every precaution. Yet there can be no doubt that they are least frequent when all reasonable means of prevention are most rigidly enforced. But every now and then cases of pyæmia multiply in wards with remarkable rapidity, and such sudden increase has been often observed after an unusually large number of operations has been treated in the same ward. When a ward is what the sisters and nurses call "heavy"—that is, when there is an extraordinary number of severe cases of injury or operation, then the chances of an outbreak of pyæmia are unquestionably multiplied. It is not difficult to find a cause for this. The atmosphere must be, under such circumstances, unduly loaded with decomposing organic matter—the very material of all others which, coming in contact with wounds, is likely to excite changes in them whereby their discharges become putrid. We are all assured of the terrible effects of inoculating the wounds of one patient with the discharges from another—as by the use of sponges in common. But the same mischief may be brought about, although perhaps not quite so strikingly, through the atmosphere. These are facts of the first importance. It is, perhaps, impracticable to prescribe any precise limit to the number of cases which may be fairly treated within a given space; but it may be safely affirmed that the fewer the better.

How are wounds and local injuries to be best managed to guard against infection of the blood? No local advantage, however great, of any measure ought for one moment to be set against the risk of pyæmia. If by any plan in the management of a wound we could avert the risk of pyæmia, though nothing else could be urged in its favor, and in every respect besides it were inferior to others, it ought for that reason alone to supersede them all. For delay and suffering and unseemly scars weigh very little indeed against the probable consequences of blood-poisoning. But, happily, such unpleasant alternatives are not often pressed upon us. So long as there is a wound, there is risk of contamination. The more quickly a wound is healed, the more quickly is a patient delivered from the perils of pyæmia. And, moreover, the more favourably—that is, almost always, the more rapidly—a wound is healing, the less likely is it to become the source of infection. Again, exposure to air hastens decomposition. Therefore we do best when we get a wound to unite by the first intention. But in order to accomplish this, wounds for the most part must be accurately closed; and, should the attempt fail—as, indeed, it too often does,—then the discharge will accumulate, and, soon becoming foul, a fertile source of blood-poisoning is engendered. In rash attempts to procure union by the first intention, more especially if care be not taken to prevent the occurrence of a cavity or space beneath, fluids may be locked up and become putrid. When contact of the edges of a wound at the surface only is maintained, while there is room for the accumulation of blood or pus or other fluid beneath, the surgeon is fulfilling the very conditions under which blood-poisoning is most likely to be effected. This is of all others the plan which would be suggested to any one who wished to procure the absorption of morbid matter. So that the dread of this, and despair of attaining, in the majority of cases, union by the first intention, has led some surgeons to adopt an opposite plan of treatment—the plan of leaving wounds from the first open and uncovered, and so arranged that all discharge shall escape most freely. But this, unfortunately, involves other risks of its own: prolonged and greatly increased risk from exposure, so that it can bear no comparison for safety with primary union. Yet this is preferable to allowing discharges to accumulate in closed wounds. It comes, therefore, to this: that it is idle to propose the universal adoption of any one single plan. The judgment of the surgeon must be exercised in every case; and the great question before him is this: are the chances of procuring union by the first intention sufficient to warrant the attempt? If so, it should be made; but then the wound should be most carefully watched, and, when evidence of the accumulation of any discharge can be detected, means should be forthwith adopted to ensure its free escape. It may not be necessary to open the entire wound in order to accomplish this. We may often after all compromise the matter, and get a large part of the wound at once to adhere, while the rest of it afterwards closes by granulation. In the endeavour to procure union by the first intention, I think the great risk is run when the accumulation of discharge behind united edges at the surface is overlooked. When there is any doubt, some small portion of the wound may be gently separated and the best way of avoiding it is, when dressing the wound, to apply gently an equable pressure in such a way as to ensure, as far as possible, complete apposition of the deepest parts. Too often attention is directed only to the surface and mere edges. So far as it can be arranged, the pressure should rather be diminished from within outwards. If this point were more carefully attended to, I cannot help thinking that union by the first intention throughout would not be so rare as it is.—*Lancet, Jan.* 19 *and* 26, *Feb.* 2 *and* 16. 1867, *pp.* 75, 109, 139, 201.

11.—ON SCROFULOUS DISEASES OF THE EXTERNAL LYMPHATIC GLANDS, AND THEIR TREATMENT BY IODINE AND OTHER LOCAL STIMULANTS.

By Dr. Thomas Balman.

[The local treatment of scrofulous diseases of the external glands has not been much dwelt upon by authors of works even specially devoted to the subject of scrofulous diseases. The importance of the subject in practice cannot be overestimated.]

From neglect, feeble health, or other causes, such swellings may assume a subacute condition; and, in place of subsiding, may go on slowly, and perhaps imperceptibly, increasing both in size and consistence, or they may manifest this peculiarity from the first. They then constitute the great majority of those cases of strumous glands which are so frequently presented to our notice in the out-patients' wards of our numerous charitable institutions. In a case of this kind I usually proceed thus:—If the swelling is recent I begin with iodine lotion, or this may be replaced by the diluted tincture of the Pharmacopœia—one part to three of water. Pledgets of lint, soaked in either of these lotions, are to be continuously applied to the tumour; and, in order to retain the moisture, they should be covered with a piece of gutta percha sheeting or oiled silk. If the tumour be of longer duration, firm to the touch, or has implicated the surrounding textures, I pencil the surface lightly two or three times with the solid nitrate of silver, or with a solution of iodine. The former is the least irritating to the skin, and is, therefore, in many cases, the best to start with. This application is repeated at intervals of five or six days. All bandages, woollen wrappers, and other such articles of dress with which the patient is usually smothered, are removed, and the parts freely exposed; and, if within a convenient distance of the sea-coast, the tumour may be also advantageously bathed with sea-water every morning.

This procedure will produce in all probability one of two results; either a gradual diminution in the size of the swelling, or suppuration. In the event of the latter happening, the abscess should be opened at once—of course in the most dependent and favourable position. The parts surrounding the incision are then to be immediately painted circumferentially with the iodine solution. The application should extend as far as the limits of the tumour. The effect of this treatment is to cause the rapid collapse and effectual emptying of the sac of the abscess, and within a very short period probably, adhesion and closure of its cavity. The punctured wound, which may be covered with a piece of tow or charpie, very often heals without the slightest disfigurement, and we are enabled, if necessary, to continue our application. Abscesses which, if allowed to ulcerate, would continue many weeks, and perhaps months, may by this treatment be sometimes obliterated in a few days.

Injections of iodine, zinc, and other astringent lotions, as proposed and extolled by Lugol, Tyler Smith, and others, have never succeeded, in my hands, in procuring any corresponding results. And the almost universal practice of poulticing in order to accelerate the formation and discharge of matter has long appeared to me still more objectionable; and I confess that I was some time ago surprised to find such an accomplished pathologist and excellent surgeon as Mr. Paget recommending this antiquated and, I truly believe, mischievous practice in the treatment of these complaints. (See "Notes of Practice," &c., Med. Times and Gaz., Jan. 1858.) However useful poultices and moist applications generally may be in acute phlegmonous inflammation of the lymphatic glands, in deep-seated or painful abscesses, or in a variety of other cases which it is scarcely necessary to name, I am satisfied that when continued for any length of time in strumous, suppurating, and other sores, whether involving the absorbent glands or other textures of the body, poultices tend to relax tissue, impair the tonicity of the capillary blood-vessels, sustain the discharge, and facilitate the spread of the suppurative process, and not unfrequently lay the foundation of sinuses and of

those horrible bridge-like marks which so often disfigure the victims of this disease.

The benefit of local stimulation by iodine is not simply limited to scrofulous abscesses. During the last two years I have been in the habit, both at the Dispensary for Diseases of the Skin and in my own private practice, of using it freely in a variety of other cases: in chronic affections of the joints, inflamed breasts, boils, carbuncles, old cicatrices, œdema, and in the slighter forms of erysipelatous inflammation of the skin. In carbuncle the effect is sometimes most striking: the pain and irritation are almost immediately relieved, and the slough is rapidly thrown off. Ganglions, when situated about the wrist, may be got rid of by the same means. They should be first punctured with a fine needle, and a slight amount of pressure continued for a few weeks afterwards.

I at first thought that the local use of iodine in the way described was novel; but I have recently discovered that Mr. Davies, in a work written five-and-twenty years ago, has recommended the external application of the simple tincture in some of the cases I have mentioned. His book, which I regard as a very valuable contribution to medical literature, should be read by all who are desirous of knowing the full therapeutic influence of this important remedy. A series of cases was afterwards published in the Lancet, by Dr. Langon, in support of Mr. Davies's views, and are well worth perusal.

A question of some importance will here naturally present itself. How, it will be asked, does local stimulation, either by iodine or nitrate of silver, subdue inflammatory action, lessen the swelling, pain, and irritation, and accelerate the cure, in such cases? The pathology of inflammation, as revealed by the microscope, explains in some measure, I think, how it does so. The phenomena of inflammation we know to consist primarily and essentially of enlargement or dilation of the blood-vessels and capillaries of the part affected; accumulation, crowding together, and final arrest of the blood-corpuscles, and their subsequent adhesion, both to themselves and to the coats of the vessels; effusion of the liquor sanguinis into the cellular and adjacent structures, causing the swelling, œdema, heat, pain, and redness which are known to characterise inflamed textures. We have to deal, then, with impeded action, diminished contractile power in the coats of the capillary blood-vessels, and consequent inability of the arteries to grasp and push forward that vital stream upon the healthy and continuous movement of which the whole fabric is sustained. Iodine and nitrate of silver, so much extolled by Mr. Higginbottom, and perhaps any other local stimulant, seems to restore this impaired vital contractility of the blood-vessels, hurries on these struggling and pent-up globules to complete their labyrinthine journey in the general torrent of the circulation. The local stimulating action of these substances must further tend to quicken the action of the absorbents, and thus materially assist in the removal of the effused products.—*Lancet, April* 13, 1867, *p.* 456.

DISEASES OF THE NERVOUS SYSTEM.

12.—TWO CASES OF TRAUMATIC TETANUS SUCCESSFULLY TREATED WITH THE ORDEAL BEAN OF CALABAR.

By Dr. Eben Watson, M. A., Lecturer on Physiology in Anderson's University, Glasgow.

[The use of Calabar bean in the treatment of tetanus occurred to several on its properties being made known. Amongst others to the late Prof. Miller, of Edingburgh ("System of Surgery," p. 515), but the suggestions hitherto have never been carried out. The following cases are therefore interesting, as being the first in which the experiment has been carried out.]

Case 1.—Annie W., aged 11 years, admitted to the Royal Infirmary on the 12th of November, 1866. About three weeks ago the patient struck her right foot against a stone and bruised and cut it slightly at the side of the

nail of the great toe. No attention was paid to it at the time. She has at present the aspect and expression of one who has trismus, and she opens her mouth with difficulty. For this "lock-jaw," which commenced six days ago, she has been sent to the hospital.

She remained in this state, and no violent spasms came on till the evening, when opisthotonos occurred in a very severe form, the body being bent into an arch of nearly three-quarters of a circle. She was so rigid in this state that my resident assistant, Dr. Forsyth, administered chloroform by inhalation, which relieved her for the time, but whenever she came out of the anæsthetic state the spasms were renewed as violently as ever; so much so, indeed, that she was again put under its influence with the same temporary good effect. While under the chloroform the outer half of the toe-nail was cut away from the still inflamed and ecchymosed matrix, and a poultice was applied.

Nov. 13th. This morning I found her as described. Her jaws were firmly locked, and her body and limbs perfectly rigid. The tendency to opisthotonos was at once induced by the patient's attempting to drink cold water, and also by touching any part of her. Indeed, even though undisturbed, the spasms were very frequent, and always tended in the direction of opisthotonos; hence the poor child found her only comfort in lying on her belly, with her head and shoulders over the edge of the bed; and at this time she required continual attention to prevent her falling out of bed, and as the spasms were coming on, her cries for help were most distressing. I prescribed a dose of calomel and jalap at once, and during the day, every two hours, fifteen drops of the tincture of cannabis indica, a drug which certainly soothes in tetanus more safely than any other.

14th. Patient's bowels have not been moved by the calomel and jalap. She continues in the same state as yesterday, but in the evening the spasms became much more severe. She was ordered half an ounce of castor oil with a drop of croton oil mixed with it.

15th. Bowels acted freely yesterday; stools quite black. She has taken the Indian hemp very irregularly, sometimes spitting it out.

Every evening there is a considerable aggravation of the spasms, and this seems to be more and more marked each successive evening.

I now determined to try the Carabar bean, and in the emergency the only preparation of which it could be got was that used in ophthalmic practice for contracting the pupil. I may here mention, for the sake of those who may not have had their attention called to this subject, that the action of the Calabar bean in sufficient doses is to paralyse the voluntary muscles, the very muscles which are spasmodically contracted in tetanus. Hence the prospect of counteracting the influence of the disease by that of the poison. I may also state that the action of Calabar bean in contracting, and that of belladonna in dilating, the pupil cannot at present be satisfactorily explained. We can only assume that in the former case the radiating fibres of the iris are paralysed, and in the latter the circular; but whether this is due, as Valentin has supposed, to the special distribution of the cerebral, and sympathetic nerves to these different sets of fibres in the iris, and to a special action of the two substances upon them, it is not easy to determine. On this point I may hereafter enlarge a little; but in the meantime I return to the narrative of my case.

At half-past two p. m. of the 15th of November, one square of Squire's gelatine paper, containing the extract of Calabar bean, was put on the patient's tongue through the space left by a missing tooth. Shortly after getting it she felt easier, was more cheerful, and kicked up her heels as she lay in bed on her abdomen, to show the power she had over them. At three p. m. she got two other squares, at seven p. m. three squares, and at ten p. m. two more. No severe spasms occurred during this evening; she had only a few short starts, but she was always very rigid in both body and limbs, and the opisthotonos and trismis were quite marked. She was more cheerful, however, and spoke more distinctly. Pupils rather contracted. She was to have two squares of Calabar paper every hour during the night.

16th. This morning I found her quite rigid, and with frequent and severe spasms. In fact, I thought either that the papers were not sufficiently strong, or that they were losing their influence on the patient. I now therefore ordered the following preparation: Extract of Calabar bean, twelve grains; white wine, one ounce. This made a muddy sort of wine of the Calabar bean, every five drops of which contained about one-eighth of a grain of the extract. Such a dose was to be given every half hour, the effects being carefully watched by my assistant. It will be noticed that the doses were given very close together, for we had already learned that their effects were very short lived. These doses were regularly given till seven p. m., by which time she had taken eighty drops or two grains of the extract. Only momentary twitches had occurred, and these principally when spoken to. At half-past seven p. m. she was in a semi-comatose condition, lying on her back, with no arching, mouth open, pupils pretty well contracted, breathing quiet and regular, pulse rather hurried and full.

In this state of things the Calabar bean was intermitted for two hours and a half—*i. e.*, till half-past nine p. m., by which time the pupils had again dilated, and transitory spasms were induced by touching or rousing patient with questions. Nine drops of the wine were then given, and five drops thereafter every hour during the night.

18th. She continues better, breathes more easily, and swallows better; pulse 84, of good strength; pupils natural. Increase the dose of the wine to ten drops every hour.

19th. Notwithstanding this increase, the patient had three severe fits of opisthotonos early in the morning, and she remained very rigid and the spasms easily excitable till my visit. I now determined to use a stronger dose of the extract, and thus endeavour to conquer the disease. For this purpose I ordered the following pills:—Extract of Calabar bean, twelve grains; ginger powder of sufficient quantity to make twenty-four pills; one to be taken every hour. By mistake the apothecary made these pills of twice the strength ordered—viz., containing each one grain instead of half a grain of the extract. This was not, however, discovered till the evening, so that the patient took one grain of the extract every hour for eight hours without any particular effect being produced. But half an hour after the ninth had been swallowed, the patient fell into the following state:—Her eyes were widely opened, staring and glassy; the pupils were contracted to pin-points; the pulse was rapid and intermitting; there was a mucous rattle in the throat, and the breathing was jerky and fitful. Patient did not answer questions, and gave no sign of sensibility. She had no spasms, neither could they be induced. In fact, all the muscles were completely relaxed, except those of the back, which were still rigid. She either could not or would not move any of her limbs, or make voluntary efforts to swallow. Some brandy-and-water and seven drops of the tincture of belladonna were poured down her throat, she not resisting, and this was repeated in five minutes. No effect was produced on the pupils, but the expression became less death-like. Patient was turned over on her side, for she had lain on her back hitherto, and then she got quit of some reddish-colored, apparently bloody mucus from the throat by both mouth and nose. The breathing was thus rendered easier, but it was at first very hurried and panting. Gradually it became fuller and slower, and the pulse likewise became slower and more regular. The pupils soon dilated, but the extremities remained quite flaccid during the greater part of the night. As soon as the breathing was partially restored, she seemed to be quite sensible, but averse or unable to move. Towards morning the spasms, though less violent, could be easily induced; and next morning, at half-past eight, I found no traces remaining of the very remarkable state in which she had been on the previous evening. She was, however, flushed and perspiring; the pupils were quite natural, but the pulse was quicker than formerly; it numbered 108 in the minute, but was soft and regular. She expressed herself as better. She had no giddiness or any other disagreeable feeling attributable to the Calabar bean, and she was perfectly correct in her mind.

I remarked that the arms, though still unnaturally stiff, were more under

the control of the will than they had been. She could move them a little, and she could separate her teeth just enough to get the edge of a spoon between them. She could also swallow better, and she lay much more quietly, and now generally on her side, in bed.

I considered it prudent to cease giving the bean to this patient for a time, and allow her to rally quite thoroughly from its effects. I therefore stopped it, and once more ordered the tincture of cannabis indica, with appropriate food and stimulants. Under this treatment she improved in strength, but not much in respect of the tetanus. Her spasms certainly never were so strong as formerly, but they were very easily produced, showing that the disease was still unconquered. Besides, the body and legs became again quite stiff, so that if one could have raised her by the foot, he could have held her straight out in any position. At the same time the face had rather a more natural expression, and she could separate the teeth about half an inch. Her power over the arms was also greater, and she could even move the head a little to one side.

Such was her state at the end of the ten days during which she had no Calabar bean. It seemed to me that the tetanus had received a decided check from the large dose of the bean taken on the 24th of November, and that it had never since assumed its former severity. Still there had been little further progress made towards a cure since the bean was stopped. I therefore recommended it in the form of tincture, made after the receipt of Dr. Fraser (Edin. Med. Journal, vol. ix. p. 124), who considers five minims to be equal to three grains of the kernel.

Dec. 6th. I ordered the patient to have a dose of five minims of the above tincture every two hours, stopping the cannabis indica.

10th. Last night without any aperient medicine having been given to her, patient had five large watery evacuations from the bowels. This was the more remarkable because she had previously required a strong dose of castor oil, often fortified with croton oil, to move the bowels, and except from the effect of such medicine, they had always remained confined. I have little doubt, therefore, that this was another of the physiological actions of the bean—viz., catharsis.

It was noticed likewise to-day that her muscles generally were much more relaxed. The expression of the face was much more natural; she could laugh and open the mouth wider than she had yet done, and she could chew her food well. Her head and limbs, both superior and inferior, were likewise capable of being moved a little; but her back and abdomen still remained rigid, and the spasms, though very slight, were easily reproduced. The tincture was continued in the same dose, but only every six hours.

After this date, her recovery was very rapid, and I find it noted in the journal on the 22nd December that for some days previously the patient had been quite well, and running about the ward. No trace remained of her formidable illness, and from the above-mentioned day she took no more of the bean.

On the 4th of January, 1867, she was sent to the Convalescent Home at Bothwell.

[The second case was a boy thirteen years of age; he received an injury of a finger whereby the nail was lost and the flesh slightly torn. The wound healed in a week; but slight tetanic symptoms appeared and were well marked at the time of his admission to the Glasgow Royal Infirmary three weeks after the injury. The case was successfully treated with Calabar bean.]

The effects of the bean were very remarkable, being chiefly seen in relaxation of most of the tetanically contracted muscles; indeed, in all of them but the muscles of the back, until far on in the treatment. *Then*, last of all, these gave way, but slowly, and as it were, reluctantly. This was well seen in the boy's case, for his back was stiff for some days after he was able to be out of bed. The effect on the eye, too, was curious. Remembering the speedy and great contraction of the pupil which the bean produces when applied locally to the eye, one could not but be surprised at the slightness

of its action on the pupil when given internally. Except when a very large dose was taken, as in the girl's case, the pupil was never contracted to a point. On the contrary, the contraction was very slight and very short-lived under the action of ordinary doses of the drug; and one of the earliest symptoms of tolerance of it shown by the patient was the cessation of even this temporary effect upon the pupil—a tolerance which had to be met by an increase of the doses. Besides, I noticed that after the effect of the bean had passed away the pupil was found to be unnaturally dilated, as if from a sort of reaction of the fibres in an opposite direction.

As to the doses of the bean given in these cases, I must remark that those given in the girl's case were large—too large on that memorable day, the 24th of November, 1866. I have already explained how twice as much of the extract was given on that occasion as I had ordered; but I am certain that, though it brought the patient into danger, this large dose checked the disease, which abated from that day. It also affords us now an admirable proof of the power of the bean over this terrible disease, and of the great good to be expected from its more moderate and safe administration. It should be remembered, too, that in tetanus the patient seems to have a wonderful tolerance of many drugs, and that, therefore, larger doses of them than usual may be safely given, and, in fact, are required by such patients before the physiological effects of the medicines are developed. This is well known to be true of opium, cannabis indica, quinine, stimulants, &c. Now, I think that the Calabar bean is, in like manner, better borne in this disease than it would be in any other. It was taken and required all along, by the girl especially, in much larger doses than I should prescribe in ordinary circumstances. The rule which I should give to others, and the one on which I mean to act myself, is to begin with a small dose, and rather to diminish the intervals than to increase the strength of the dose, till we become better acquainted with this powerful agent. Yet, after all, this is one of those drugs which can only be rightly given in cases constantly under good watching; for its physiological action must be produced else no good result can be expected from it, and to do so a *sufficient* dose must be given. I know of no general rule that can apply in such a case, but the one of beginning with small doses and increasing them cautiously as effects are or are not produced adequate to counteract the violence of the disease under treatment. I shall only add, in conclusion, that I greatly prefer the fluid form of administering the bean, as giving less probability of its accumulating in the stomach, which might occur if it were given in the solid form—as, for example, in pills repeated very frequently. The tincture, if well made as directed by Dr. Fraser, is certainly the best and safest form in which it can be administered; and five minims of such a tincture is quite a safe dose to commence with in the case of persons above ten or twelve years of age, as far as my experience goes.—*Lancet, March* 27, 1867, *p.* 265.

13.—IDIOPATHIC TETANUS—TREATMENT BY TOBACCO AND NICOTINE.

Under the care of Dr. Lyons, at the Richmond, Whitworth, and Hardwicke Hospitals, Dublin.

[The patient, a child ten years of age, had all the usual symptoms of well marked tetanus. He had pneumonia of the left lung. His previous history could not be found out, but there was no external wound or injury of any kind.]

That evening, by direction of Dr. Lyons, an enema was given, of tobacco 3i. to ℥xx. of water, ℥v. of which were injected; the effects were very marked, for after a few minutes he became quite unconscious, and all the muscles were relaxed; this state did not last longer than a quarter of an hour, when the tetanic symptoms recurred, but with less urgency than before.

October 29th. Had a great number of attacks during the night; slept

none; suffered from flatulence, which was greatly relieved by enemata of turpentine, which brought away a quantity of hardened fæces.

An enema of tobacco was given in the evening, not so large as the former one; the effects it produced were not so marked.

Enemata of turpentine were given to clear out bowels, which was not fully accomplished for a number of days

30th. The patient is slightly improved, but he is still affected with repeated attacks of the spasms, of which as many as forty-five were counted during the day and night; the breathing is still difficult; expectoration of a frothy mucous character; cannot cough it up; but instead makes strong expiratory efforts; drinks milk and tea, but is not allowed any solid food; no stimulant given. Ordered:—

℞. Nicotinæ, gtt. unam; ext. gent. q. s.; ut fiant pil. vi. St. i. secundis horis.

The pills had a perceptible effect in lessening the spasms during the night; four turpentine enemata were given during the night; he slept for two hours.

31st. Going on favourably; breathing during the spasms very difficult; still expectorating a good deal; pulse 100. Ordered:—

℞. Nicotinæ, gtt. duas; ext. gent. q. s.; ut fiant pil. viii. St. i. tertius horis.

An enema, consisting of leaf tobacco gr. xxx., infused in a pint of water, was ordered, five ounces at a time; also a warm bath; both the pills and enema had a good effect.

November 1st. Three drops of nicotine were ordered to be divided into the same number of pills, one to be given every third hour; slept from three to eight a. m.

2nd. The pills were repeated, also a warm bath; pulse 92.

3rd. Tobacco was ordered as before in enema; pulse 88.

4th. A castor-oil and rhubarb draught ordered; also enema of tobacco as before, and bath.

8th. Enema of tobacco as before.

9th. Nothing ordered.

10th. Enema of tobacco and a cough mixture.

14th. Enema of tobacco.

16th. Tobacco enema, gr. xx. to the pint; ℥ v. to be injected; this was the last enema given.

19th. No attack of spasms; cough better, but still has a slight rigidity of the muscles of mastication; can open his mouth about an inch.

21st. Was allowed up for the first time to-day; pulse 88. The patient has now completely recovered without much loss of flesh,

The spasms continued for a period of twenty-six days; and he was suffering for four days before admission.

The total amount of nicotine administered from October 30th to November 2nd, amounted to nine drops.

Juice tobacco enemata were given from October 28th to November 16th, as follows:—

A larger quantity than actually required was usually ordered, to provide for repetition of the enema if the first came away without effect.

Oct.	28,	60	grains of Tobacco infused in a pint of water,	5	oz. were injected.
"	29,	60	" "	4	"
"	31,	30	" "	5	"
Nov.	3,	20	" "	5	"
"	4,	20	" "	6	"
"	8,	20	" "	6	"
"	10,	20	" "	6	"
"	14,	20	" "	6	"
"	16,	20	" "	6	"
		270		49	

—*Medical Press and Circular, Dec.* 5, 1866, *p.* 572.

14.—CASE OF TRAUMATIC TETANUS SUCCESSFULLY TREATED BY THE DIRECT APPLICATION OF INFUSION OF TOBACCO.

By JOHN B. JUNOR, Esq., Peebles.

[The patient, a girl, nine years of age, had received a severe injury of the leg by the fall of a large coping stone. There was a lacerated and contused wound of the calf of the leg extending from immediately below the knee to beyond the ankle, eight and a half inches long, and above four broad, laying bare the posterior tibial artery in the whole of its length. In the course of a few days two large sloughs came away, after which water dressing was applied, and the granulations appeared healthy.]

When I paid my visit on the 31st, I noticed a peculiarly anxious expression of face; but as the wound had been newly dressed, I attributed it to pain. Next day, she complained of her jaws being stiff, which excited my suspicions, and I ordered fomentations. When I next saw her, she could open her mouth only to a trifling extent, and the muscles of the neck and abdomen were very rigid. I ordered eight drops of chlorodyne (which was the sedative I used throughout, except on two occasions, which I shall allude to at the end, not to interrupt the narrative) to be given every four hours, fomentations of a decoction of poppy-heads to be applied to the abdomen, also linseed-meal poultices, made with the same decoction, to the wound.

The chlorodyne procured a little sleep, but the tetanic symptoms increased. The rigidity gradually extended over the body, and the paroxysms became more severe and frequent.

I now applied a belladonna lotion to the wound, and raised the dose of chlorodyne to ten drops, which produced a decided amelioration of the sufferings; the mouth opening to a greater extent, and the muscles of the abdomen becoming less tense. This, however, did not last long; all the symptoms gradually increasing in intensity.

On the 5th of September, six days after the first indications of tetanus appeared, I applied to the wound stupes of an infusion of Cavendish tobacco, one half-ounce to the pint of water.

The state of matters at this time was as follows: The muscles of the jaws, neck, back, legs, abdomen, and arms, were quite rigid, the legs widely separated and drawn up, and the hands twisted round. The paroxysms were very severe and frequent, causing contortions of the face (the tongue was frequently bitten), violent shaking of the whole body, and difficulty of breathing from spasm of the muscles of respiration. The sufferings of the child were extreme!

Within two or three hours after the application of the tobacco, the improvement was most marked. All the rigid muscles became, to a considerable extent, relaxed; the mouth could be opened about half an inch, the paroxysms were less severe and frequent, and a good deal of sleep was obtained.

The tobacco caused no sickness; but the appetite, which had been hitherto good, completely left the child, and the efforts to induce her to take food or stimulants invariably induced a paroxysm. I had recourse to beef-tea injections.

After applying the tobacco for three days, as the pulse became very weak and the strength was going rapidly down, I went back to the belladonna lotion. The appetite returned, but unfortunately, the tetanic symptoms became worse also, which caused me again to apply the tobacco (this time one ounce to the pint), with, as on the former occasion, favourable results, but to a greater extent, and without interfering with the appetite. The paroxysms were comparatively trifling and at long intervals; the muscles, however, of the back, legs, and arms continued rigid, and the body, when lifted, was as stiff as a board.

On the 23rd of September, as the wound, which had been rapidly healing, was looking rather unhealthy, I removed the tobacco, and applied water dressing. About three or four hours after I was sent for in great haste, as the pa-

rents thought the child was dying. I found her suffering from a more violent paroxysm than she had yet had, suffocation seeming imminent from the spasm of the respiratory muscles. She had been getting rapidly worse from the time of the change of the dressing. I at once re-applied the tobacco, and in the course, I may say, of a few minutes, the paroxysm passed away, and matters returned to their former state.

Ten days after, for the same reason, I ventured to substitute the water dressing, again the paroxysms returned, although not so severe, and again the tobacco dispelled them.

I put a piece of lint, wet with black wash underneath the tobacco cloth, and the wound continued to heal kindly till the termination of the case. The pulse was quick throughout, about 120, but never very weak, except when the child refused to take any nourishment.

About ten days after I began the use of the chlorodyne, as it was paralyzing the expulsive powers of the bladder, I gave tincture of Indian hemp instead, fifteen drops every four hours. This had not the same sedative effect, sleep almost left, and the tetanic symptoms rather increased. In about forty-eight hours the bladder recovered its power, and I returned to the chlorodyne. On an after occasion, I was obliged to cease giving it, and tried sol. mur. morph., eight drops every two hours, without any soporific effect. I resumed the chlorodyne as soon as I could, and as it was not necessary to give it so frequently, I did not require to try any other sedative,

After the first eight or ten days, I felt satisfied that the tetanus would not be cured till the wound was healed, and my object in treatment was, to keep the paroxysms as far as possible under control, and maintain the strength of the patient by nourishment and stimulants until that was accomplished. The result proved that I was right. As the wound contracted, the rigidity of the muscles abated; but it was not till the 9th of October that they were sufficiently relaxed to allow the child to sit up in bed. The spasm left the injured limb last. To-day, 30th October, I found her by the fireside, and the wound completely cicatrized.

There can be no doubt that in this case, the recovery of the patient was due to the tobacco application. The giving up of the use of it was always followed by an aggravation of the tetanic symptoms, which were at once relieved by resuming it.

The suggestion of Mr. Tyrrell, of Dublin, to produce a larger raw surface by blisters or otherwise, in idiopathic attacks, is strengthened by this case.

I tried ineffectually to get nicotine in Edinburgh; but as the remedy was a very severe one for so young a patient, and the case was promising well, I did not think it necessary to send to London for it.

The superiority of chlorodyne over the other sedatives which I used was very decided; and I was so satisfied with it, that I would not have made any change had it not seriously diminished the expulsive powers of the bladder. I find that chlorodyne produces this effect, when taken for a length of time in frequent doses.—*Edin. Medical Journal, Feb.* 1867, *p.* 685.

15.—ON THE TREATMENT OF DELIRIUM TREMENS BY INDIAN HEMP.

By Henry J. Tyrrell, Esq., Surgeon to Jervis Street Hospital, Dublin.

[The patient was 40 years of age; pulse 90, weak and compressible; pupils dilated, and tongue covered with a white, creamy fur. He had had no sleep for three nights. He had been an opium-eater until 12 months before, when he completely gave it up, as he found his health was suffering from it. He had had delirium tremens twice before, and stated that on each occasion Indian hemp, given him by Dr. White, of Downpatrick, had cured him.]

As the use of opium was out of the question in the present case, I determined to give the capsicum treatment a trial, and accordingly I ordered two boluses, each containing 30 grs. of capsicum—one to be given ever third hour. His stomach rejected the first, the second he did not vomit; they did

not give any relief, as on the next day, the 16th, he was much worse in every respect, had no sleep, and his mind was evidently affected. I ordered him 3 draughts, each containing ℥20 of the tincture of cannabis indica, one to be taken every third hour. He had the first at four p.m., after the second he became very excited; at eleven p.m. he got the third, and at one a. m. he fell into a deep sleep which lasted about four hours.

When I saw him at ten a.m. on the 17th, he was quite a different man; the nervous excitement was gone; he expressed himself as quite well, but very weak and hungry. During the day he drank two pints of strong beef-tea, and in the evening he took another draught, as he was afraid he would not sleep without it.

He remained in hospital two days longer to recruit his health, and left on the 20th quite well. As the treatment by the Indian hemp was so satisfactory, I wrote to Dr. White to test the truth of Mr. K.'s statement, and he kindly informed me that he treated Mr. K. on two occasions with the Indian hemp, and that the effect was marvellous. The dose he gave was forty drops every hour and a half, and that he was obliged to increase it to eighty drops before sleep was produced—altogether he used in the first attack one ounce, and in the second a little more of the tincture.

Whether there was a difference in the strength of the tincture, or that the attack for which I treated him was only beginning, it is remarkable that 60 ℥ was only required.

I am not aware that the use of Indian hemp has been adopted in delirium tremens, at least I do not find it mentioned in the books I have consulted; and I certainly would not have prescribed it, had not the patient mentioned its use to me; and although opium-eating is very uncommon in this country, at least in hospital patients, still it is of great importance to have a medicine which may be used instead of it, when that drug is unsuited from idiosyncrasy or any other cause.—*Medical Press and Circular, March* 13, 1867, p. 244.

16.—DELIRIUM TREMENS—TREATMENT BY CAPSICUM.

(From the Clinique of Dr. Lyons, at the Richmond, Whitworth, and Hardwicke Hospitals, Dublin.)

Further experience in the use of this somewhat novel remedy has satisfied Dr. Lyons of its value and efficacy. Its success when morphia had entirely failed has been already noted in our pages. Since then it has been employed repeatedly, and with like excellent results. It may, therefore, be confidentially recommended as a safe and judicious remedy for general use in this malady. It produces, says Dr. Lyons, a sense of warmth and comfort in the stomach when first taken, allaying the agitation, debility, and cardiac and epigastric anxiety, which are such constant and distressing features of the disease. In from twenty to thirty-grain doses, made up in bolus with honey of roses, it can be taken without inconvenience, and in from one to three hours will be found to produce sleep, from which the patient awakes conscious and convalescent. A recent and very striking case in the Whitworth Hospital, under Dr. Lyons's care fully confirms these observations.—*Medical Press and Circular, Dec.* 19, 1866, p. 619.

17.—CASE OF PURE UNCOMPLICATED DOUBLE BELL'S PARALYSIS.

By Dr. Lyons, Richmond, Whitworth, and Hardwicke Hospitals, Dublin.

Amongst the most interesting cases which for some weeks has been the theme of comment and study in Dr. Lyons's wards, has been a well marked example of this extremely rare affection.

The patient is a man of fine vigorous form, aged 28, previously healthy, and of by no means generally intemperate habits. About two months since,

after a drinking bout, he lay all night on a damp floor, exposed to a severe draught, blowing on his face. When he came to himself the next day he found that the right side of his face was paralysed, and in less than a week subsequently the left side became engaged. He now became alarmed at his condition, and sought admission into hospital. In the state of extreme apprehension and dejection of spirits from which he now suffered, and with the total expressionless aspect of all his features, the conjested eyes and formless pendent and drivelling lips, and imperfect speech, the first impression left on the mind was that produced by a patient labouring under profound centric cerebral lesion with general paralysis; and Dr. Lyons confesses that he was all but inclined to consider the case unfit for admission except to some asylum for incurables. Careful exploration satisfied him, however, of the complete absence of any paralytic lesion than that of the portio-dura at both sides. It was not, however, for some days that this opinion could be confirmed. The sense of touch, taste, smell, hearing, and sight were rigidly tested and found to be perfect. There existed the incapacity to close the eyes, while the lower lip hung so powerless that in shaving he had to adopt the expedient of fixing it by the teeth. Mastication and swallowing of food were rendered necessarily difficult and troublesome by the lodgment of parts of the alimentary bolus and fluids in both dental arcades, while all words involving the articulation of the labials were pronounced exceedingly imperfectly. The paralysis of all parts of the face dependent on the seventh pair was complete and extreme. After suitable preparation of the system the patient was placed on the use of nux-vomica; half a grain of the extract subsequently increased to one and a half grains was given in pill three times a day. Blisters were applied over the root of the pes-anserinus, and dressed with an ointment containing two drachms of nux-vomica to the ounce. In about three weeks the left side of the face, that which was last affected, gradually and finally got well, and perfect power was restored to all its parts. The right side proved much more obstinate and rebellious to treatment. He was repeatedly blistered, hypodermic injection of strychnine, about one-twentieth of a grain was repeatedly employed, and finally electricity was used for a protracted period. A slow but very decided gradual amendment became perceptible, and every one of the affected muscles re-acquired a certain amount of power, both zygomatics, the levator labii, superioris alæque nasi, corrugator supercilii, orbicularis palpebrarum, and oris being severally capable of being thrown into partial action at will. Amendment steadily progresses, but at this time is not yet fully completed. This case is one of unusual interest from the obscurity of it, and the difficulty of the diagnosis at the outset, the usual contrast in muscular power and expression which so facilitates diagnosis in the ordinary form of one-sided Bell's paralysis being here wanting. Of the rarity of the affection in its double seizure some opinion may be formed, from the fact that no mention is made of it in the works of Watson, Trousseau, or Aitken, and M. Devaine appears to have met with no case, except in connection with centric cerebral lesion, and complicated with paralysis of the fifth and other nerves, resulting therefrom.—*Medical Press and Circular*, *Dec.* 19, 1866, *p.* 619.

18.—CASE OF HYSTERICAL CHOREA.

Under the care of Dr. MURCHISON, at the Middlesex Hospital.

[The patient was a domestic servant. Her illness commenced about six weeks before admission, without any apparent cause, and consisted in severe convulsive movements, chiefly on the left side of the body.]

For the first three weeks the attacks came on only during the night, but subsequently they became more severe, and occurred in the daytime as well as at night.

After the patient's admission these fits were found to present the following

characters. They commenced with a choking sensation like globus hystericus, and successive efforts at deglutition. These were soon followed by violent muscular agitation, confined for the most part to the head and the left side of the body, and interrupted occasionally by severe spasmodic rigidity of certain muscles, as the result of which the head was drawn sometimes to one side and sometimes to another, and occasionally there was a condition approaching to opisthotonos. The movements were so violent that the patient must have hurt herself if she had not been in bed. Any attempt to restrain them only made them worse. The attack was not preceded by any scream, or accompanied by any loss of consciousness or pain. The patient would converse freely while the movements were going on, and with her right hand endeavor to restrain the movements of the left; and what was more remarkable was that the movements were to some extent under the control of the will. In the midst of a fit she could pick up a pin or a card and hold it with her left hand, which went directly at the object and grasped it, the movements being for a few moments suspended. Sometimes she had to wait a few seconds before trying to seize the object. The duration of the fits varied from a few minutes to several hours. She had five, six, or more during the day, and often they appeared to be induced by excitement, as at the hour of visit. There were no movements during sleep, and never any in the intervals of the fits.

As regards her other symptoms; the pulse was 84 and regular; the physical signs of the heart and lungs were normal; the tongue was clean and moist; the appetite was capricious, but there was no symptom of indigestion; the bowels were regular. There was no headache; but there was slight strabismus, the left eyeball, when she looked upwards, being drawn upwards and outwards more than the right. The left pupil was also about one-third larger than the right. The patient stated, however, that ever since she had been a child there had been something peculiar about her eyes.

The patient was ordered a pill containing a grain of valerianate of zinc, a grain of sulphate of iron, and three grains of extract of gentian, three times a day; and, on January 7th, 1867, she was up and greatly better, the fits consisting of little more than slight muscular twitchings.

Although occurring in a rheumatic patient, Dr. Murchison pointed out that the symptoms in this case differed in two particulars from true chorea—viz.: 1. In the complete intermission of the movements during the intervals of the paroxysms. 2. In the patient's ability during the paroxysms to control to some extent the movements, and at once to seize a small object and to hold it. The case was evidently one of those which had been well described by Trousseau under the designation of "hysterical chorea." In one of the cases recorded by Trousseau, the movements were equally violent as in the case now recorded; and also confined for the most part to the head and the left side of the body. But if the patient was placed in front of a piano, the movements at once ceased, and she could play for hours without failing in a single note.—*Lancet, March* 2, 1867, *p.* 270.

19.—ON FARADIZATION AND GALVANISM.

By W. H. Sandham, Esq.

Faradization may be effected by an electro-magnetic, a magneto-electric, a friction, or a galvanic battery. This is not all, it may be produced by an inverse or a direct intermittent current from any one of these batteries, and they may be applied with one pole on the spine, and another on any part of the body, or one pole at the origin of a nerve or muscle, and the other at the peripheral extremity of the former on the centre or insertion of the latter. I have given the treatment of disease by electricity some study, yet I am often at sea as to the instrument, the current, or the mode of application used in, I may say, most cases reported; so that future reports of cases would be far more valuable were the reporters more particular in naming the instrument, the particular current, and the mode of application.

Hemiplegia.—I treated a lady lately who fell down suddenly in her bedroom, and was taken up hemiplegic on the right side. Her arm was permanently flexed to an acute angle, the fingers almost stuck into the palm, her leg powerless, and foot so clubbed that when on the ground it rested on the outer edge; muscles of the face and tongue unaffected; sensation and heat of the whole side normal, or rather more than the opposite side. She was treated by various medical gentlemen, and twelve months after the first attack I was consulted. The muscles of the superior extremity were much wasted, and in the flexed position described, while the inferior extremity was so swollen and œdematous that from the thigh down was one shape, it could only be moved by her attendant. On the third application of the inverse interrupted current of the primary wire of an electro-magnetic apparatus, I could, with the greatest ease, extend the forearm and fingers at pleasure. The leg continued longer insensible to the current, but this too improved rapidly; the œdema of the limb entirely disappeared, and she could now lift it and make a kick at you herself. I used the interrupted current and the continuous uninterrupted current of a galvanic apparatus on alternate days. The muscles of arm and leg became defined, as the lady herself used to say, "This arm is now more plump and round than the other." But at this stage of progress, some kind friends, who possessed too much brains, interfered, and she gave up the treatment, all because she suffered a little severely during the application of the interrupted current—notwithstanding the evident improvement. While treating this case I was forcibly struck with the idea—in fact, convinced—that in such cases as the one described, we come to the conclusion that one half the body is paralyzed, but I now think this a very erroneous diagnosis. Take the arm in this case: it is permanently flexed from the moment of the fall. Is this evidence of paralysis? Nay, rather evidence against it; for after passing an interrupted current for a few minutes along the extensors, I could extend or flex the limb and fingers at pleasure—proving either that the extensors alone were paralyzed, or that the flexors were permanently flexed by spasm, caused by spinal irritation without paralysis of the extensors at all; the current at all events either suppressed the spasm or restored the paralyzed extensors, so that the one antagonized the other, as in health. I am now disposed to think this was not a case of paralysis at all, but a state of parts produced purely by spinal irritation. The lady's intellect, speech, sight, digestion, and circulation, were healthy. I think this view of helpless limbs much overlooked, and very suggestive to a thinking mind. I here put this idea before my medical brethren, in hopes others may reflect thereon, and give us their experience; for so forcibly struck was I by this case, that I conclude we often arrive at a wrong conclusion, when on seeing one who has lost the control of a limb or the power of locomotion, that paralysis is always the cause, when permanent spasm, consequent on spinal irritation or injury at the origin of a nerve, may be the cause.

Distressing Facial Neuralgia.—Over a month since a Cork gentleman consulted me. He had most acute facial neuralgia of right side; sometimes it was intense in the temple, sometimes in the upper, sometimes in the lower jaw, and again immediately in front of the ear. It commenced about nine months ago. He did everything that was recommended to him; among the rest he took ten dozen of quinine pills, used liniments, mustard, and other plaisters, stupes, &c. At length he was recommended a sea trip, and so anxious was he to get well that he forsook his business, and at considerable loss and expense sailed for Rotterdam; but he suffered all the way, and returned as bad as ever, when some party whom I before cured recommended him to me. I treated him with a direct continuous galvanic current along the three branches of the fifth nerve. The very first application afforded relief, and after a week's treatment (daily application) he said "that he had not had such a week for months." I repeatedly asked him had he any bad teeth on that side. His reply always was "No." But conceiving I used to hunt, as it were, the pain into or by the side of two teeth, I came to the conclusion something was there wrong that again lit up the neuralgia after I

had removed it, and I discovered that when a cold body touched near the teeth a pain shot through them, and so lit up the neuralgia again. I gave my opinion that unless two small teeth were extracted I could not permanently cure the neuralgia. He consented, and with a key instrument, along which I conducted a galvanic current for about five minutes, I lugged out the two teeth at once. I applied galvanism on two successive days, so that after nine applications he continues well to this date. His own words are—"I am in Heaven." No medicine whatever administered.

Facial Neuralgia of Three Months' standing.—Mrs. C——y, Cork, came to me after three months' intense suffering from facial neuralgia, for which she had been treated by several medical men. When I first saw her the side of the face and about the ear was greatly swollen, and profuse purulent discharge from the ear, with intolerable pain in side of face. I used a direct continuous galvanic current daily for a week. The first application removed all acute pain, and the swelling and discharge rapidly disappeared. She continues well to this hour. No medicine given.

Severe Lumbago of Three Months' standing.—Mr. M., Cork. After three months' suffering from lumbago, consequent on spinal irritation, during which time all that the ingenuity of his intelligent physician could suggest was tried, he sent for me. After the fifth application of a direct continuous galvanic current, and without the aid of any medicine whatever, on the fifth day he was able—free from pain—to be out of bed, and to attend to his business; and after the ninth application I left him well, and he still continues so; this is now several months past. But to enumerate the number of cases successfully treated by me in Cork would be tedious and unnecessary after the many already reported by me in the Medical Press and Circular, and the Electrician. Suffice it to say, that electricity as a therapeutic agent, scientifically administered, cannot any longer be neglected; and I am astonished beyond measure, in the face of the vast mass of evidence in its favour, that a single medical man can be found bold enough to ignore it in the present day, but it is only those who are unacquainted with what it is capable, who venture to do so. Lately, in consultation with two medical gentlemen, in a case where the patient had not had a half-hour's real sleep for a couple of months (notwithstanding that one of them tried a large proportion of the drugs in the Pharmacopœia to produce it), and was suffering from intense dyspnœa, owing to pure spasm of the respiratory muscles, on proposing galvanism one of them replied:—"Oh! it hurries the circulation too much." The other—"Oh! it stimulates too much," &c,, &c. Still I persevered, and galvanism allayed the dyspnœa, and secured a sleep that lasted from eleven o'clock p. m. to nine o'clock a. m., next morning. Surely this was not a coincidence: did sleep follow because three medical men met in consultation? Certainly not. I look upon electricity as so important an agent in the treatment of disease, that were I one of the court of examiners attached to any of the universities, I would reject any candidate for a medical or surgical degree who could not give evidence of his having well studied electricity as a remedy in disease.—*Medical Press and Circular, Jan.* 30, 1867, *p.* 96.

20.—ELECTRICITY AS A TONIC IN ANÆMIA, DYSPEPSIA, AND GENERAL DEBILITY.

By Dr. George M. Beard, New York.

That electricity is of great service in certain forms of paralysis is a fact long since recognised by the profession, but until within a few years its wonderful tonic powers had not even been thought of. The researches of Meyer and Remak in Germany, and of Duchenne and Becquerel in France, have done much towards the development of the remedial uses of this mysterious agent; and the success that has attended their experiments in the treatment of nervous disorders is worthy of far more attention than it has hitherto received.

For while it is true as is commonly supposed, that galvanization and faradization* are specially indicated in certain forms of paralysis, it is also true that they are still more valuable in general nervous delibility, whether it manifests itself in the shape of dyspepsia, chorea, neuralgia, anæmia, or amenorrhœa. For a number of chronic, asthenic affections, faradization is a far safer as well as a more effective remedy than any internal tonic with which we are familar. If it be applied thoroughly, with the negative pole at the feet, and the positive down the spine and over the stomach and bowels, its immediate effects are in some cases exceedingly exhilarating, and if regularly and faithfully repeated it permanently benefits the whole digestive apparatus.

Case 1.—Mr. E., a gentleman twenty-three years of age, presented himself, complaining of loss of appetite, hypochondriasis, and great nervous depression. He was a tall, spare man, somewhat above the medium height, with sunken eyes, and a sallow, anxious countenance. It was evident that he had lost all his enjoyment of life.

When he first came into our office, he stated that for a year and a half he had been the victim of extreme nervousness, and had found it very difficult to perform half of his duties where he was employed. He said that it was impossible for him to confine himself to his writing desk for any length of time, but that he was obliged to throw aside his pen and walk about to find relief. Constipation and vertigo were prominent symptoms, and the patient was evidently in an anæmic state. He had taken much medicine, with only temporary and partial relief. When the electricity was first applied to him in the early part of July he could bear only the slightest current. He continued to come regularly every third day, until the first of August, with gradual but marked improvement. The constipation was entirely cured; the vertigo no longer annoyed him; and he could stand or sit at his desk all the day without inconvenience.

Case 2.—Mr. F., a broker, about thirty years of age, came to us one day for the purpose of trying electricity as a last resort for the cure of a peculiar and aggravated form of neuralgia. He was a short, puny youth, with a hollow, unhealthy cast of expression, but of an exceedingly nervous, vivacious temperament. The muscles of his chest and extremeties were small and soft, and the horrible agonies he had endured seemed to have left their impress on the whole system. The case is somewhat remarkable.

He stated that for over two years he had been a great sufferer from severe paroxysms of pain near the region of the kidneys. The attacks came on periodically every eleven days, seldom varying more than twenty-four hours, and lasting from one to two days. He had taken immense quantities of quinine, and had been somewhat benefited by it, as he thought, but the relief it afforded was merely temporary. We examined his urine with care, and arrived at the same conclusion as his previous advisers—viz., that the difficulty was mainly nervous. The patient received his first application the 10th of July, and continued to come every other day until the middle of August.

For the first time in many months he escaped the usual paroxysms, and up to the time he discontinued treatment he had no return of his sufferings.

Case 3.—Mr. C., aged fifty-two, first presented himself for treatment October 1, stating that for a year and a half he had suffered from jaundice. The whole surface of the body was of a marked yellow colour and the conjunctiva presented the characteristic appearance. He complained much of anorexia and nausea, but most of all of a continual and overpowering drowsiness. Electricity was applied on his first visit, and also on the 7th and 16th inst. At the end of the treatment, his skin and conjunctiva had regained their normal colour, his mind was clear and bright, and to all appearance the cure was complete.

Case 4.—In the early part of September of last year, a pale-lipped, sad-eyed lady came panting into our office, and almost fell down on the settee before she could begin to tell her story. So exhausted was she with the

* For the benefit of those who have not given the subject special attention, it may be well to explain that galvanization refers to the use of the primary current, faradization to that of the secondary.

exertion of ascending one flight of stairs, that her speech was at first only in broken utterances, and we very naturally surmised that she was laboring under some organic derangement of the heart. But the history of the case seemed to point unmistakably towards anæmia as the prime source of all her unpleasant symptoms. She was troubled with great depression of spirits. Amenorrhœa had existed for nine months.

The patient was so hysterical that the first application was given with difficulty. She could endure but the slightest current. Whenever its strength was much increased, faintness was at once produced. This extreme susceptibility was, however, speedily overcome, and after the first week she could bear a current of ordinary severity without the slightest discomfort.

Applications were made every other day for one month, at the end of which time the improvement was most satisfactory. Her appetite was good, her mind cheerful, and her cheeks presented the ruddy glow of health. The menses returned after seven or eight applications. A few days ago she came briskly up the stairs, with a light, elastic step, and with a smiling rubicund countenance. All her cardiac symptoms had disappeared, her breathing was natural, and her whole appearance was that of a person in the heyday of youthful vigour.

Case 5.—J. D., aged twenty-three, stated that for one year he had suffered from dyspepsia. He found it necessary to exercise the greatest caution in diet, and for months he had been unable to eat a hearty meal without discomfort. So thoroughly had he crucified all his love for the palatable and nutritious, and so narrowly had he restricted himself in table enjoyments, that he had reached that terrible stage when every day was a living death. Since the first appearance of the disease he had lost some thirty-five pounds in weight. During the month of September he received ten general applications, when he reported that he could eat and assimilate the ordinary articles of diet without physical or mental disquietude, and he had regained some twenty pounds of flesh.

We have employed faradization in a number of cases of anæmia and general debility, depending on a variety of causes, and uniformly with most satisfactory results, except when pulmonary tuberculosis existed. Inasmuch as the tonic powers of electricity are very observable in asthenic cases, dependent on or associated with derangement of the nervous or digestive apparatus, it would be natural to infer that consumption, which is essentially a disease of debility, would be speedly benefited by electrical treatment. But it appears that such is not the case. We find that those who have tubercular deposit in the lungs are not benefited, but are positively injured by the application of electricity. Whenever we have applied it to them they have always complained of exacerbation of their symptoms. It is difficult to find any theory on which this inconsistency can be satisfactorily explained. It may be that the use of the primary current would serve a good purpose in such cases; but so far as our observation goes, faradization works evil, and only evil, on patients who have passed into the second stage of pulmonary tuberculosis.—*Medical Mirror, Feb.* 1867, *p.* 76.

DISEASES OF THE ORGANS OF CIRCULATION.

21.—REMARKS ON CHLOROSIS AND HEMORRHAGE.

By Sir Henry Marsh, M. D., Bart., Surgeon in Ordinary to the Queen in Ireland.

[Of those afflicted with this disease a very large proportion are strumous. Sir Henry Marsh has never met with a case of spontaneous chlorosis, except in a member of a family, upon each of whom the characteristics of the strumous diathesis have been unequivocally impressed. Passing on to the part of the paper referring to the treatment of chlorosis, Sir H. Marsh remarks:]

Neither do bark, nor mercury, nor wine, nor bleeding, nor opium, nor antimony, even when most judiciously administered, exhibit effects more

manifestly therapeutic than iron does in this disease; nor does iron bring more of wealth to the inhabitants of the country from the bowels of whose earth this valuable ore is dug up, than it does of richness to the blood of the chlorotic patient. It is remarkable, too, how universally diffused are chalybeate springs, as if it were the design of Nature that iron in abundance should be mingled with the blood, and that it should be incorporated largely with vegetable matter. Whether the preparations of iron produce their effects directly by augmenting the proportion of red corpuscles in the blood, or indirectly by invigorating and improving the digestive function, still there is no medicine the curative properties of which are more fully established. The probability is, that it acts usefully in both ways. Iron, then, judiciously administered, is a most valuable and important therapeutic agent. Nor is its salutary action restricted to chlorosis; there are many other pathological conditions of the animal economy over which it possesses the same power in improving the blood, and thus restoring tone to the nerves and vigour to the muscles. Often in chlorotic patients have I watched the change wrought in the system from day to day under the vivifying influence of this remedy, and most striking, and sometimes rapid, have been its health-restoring effects. Were all cases of chlorosis simple and unmixed—were it not liable to the various complications to which we have already alluded, then, indeed, the treatment were easy, and the cure certain. But it is not always the case: various co-existing affections complicate the treatment, and even forbid for a time the employment of chalybeates; besides, there are individual constitutions so intolerant of iron, so peculiarly affected by it, that we are compelled altogether to forego the administration of this useful remedy. We occasionally, also, meet with patients who cannot endure it, except in quantities too small to effect a cure; we are, in consequence, sometimes compelled by necessity to look around for a substitute, and the most efficient one which I have been enabled to discover is bismuth. Under the influence of this metal I have seen gradual and satisfactory recoveries take place in persons whose idiosyncrasy forbade the use of iron. I must not omit to mention the marked utility of cinchona and its salts, and of the carbonate of ammonia. Many bitter vegetable tonics, also, are productive of benefit; but I place more reliance on bismuth, carbonate of ammonia, and the salts of Peruvian bark, than on any of the other substitutes for iron which are usually prescribed. The injurious effects produced by iron are throbbing and pulsation of the vessels of the head, headache, vertigo, and sometimes epistaxis. In one case which lately fell under my notice it produced all the symptoms of intoxication; in another, though given in moderate doses, it caused a delirium which did not subside until the third day. Its tendency is also to produce acceleration of the pulse, heat of skin, and febrile excitement. In a few instances I have observed a well-characterized periodic fever to have resulted from its excessive administration.

There is another ill effect which iron is apt to occasion,—constipation of the bowels; this itself is one of the most uniform symptoms of chlorosis; it is, however, augmented by the ferruginous treatment. Hence arises the important practical rule of thoroughly evacuating the bowels, and of completely allaying intestinal irritation, as a preliminary step to the administration of iron; and of combining with it, during the whole progress of the treatment, such mild aperients as are best suited to the individual constitution, and best calculated to maintain a sufficient and regular action of the bowels.

The mode of administering iron is not unimportant. There is none superior to that of drinking the natural waters at a chalybeate spa; its distance enhances its value, because it involves the necessity of travelling, of change of air, climate, scenery, and associations; and the more the patient enjoys travelling, the more exhilarating will it be to the spirits, and the more effective will the remedy prove. Of all the distant spas, I know not one more generally efficacious than the Langen-Schwalbach, in Nassau. There are many, however, for whom the weakest of these springs is too powerful; for such, a water less strongly impregnated with the mineral should be selected. Domestic or pecuniary circumstances, and oftentimes the actual

condition of the patient, will preclude the adoption of this remedy; so that, for the many, the treatment must be conducted without removal from the paternal roof. To the labours of the chemist we are indebted for several excellent new forms in which this mineral may be exhibited; nor is this without its value, for the preparation which agrees best with one constitution does not accord equally well with another. There is also considerable variety in their effects; the muriated tincture, for example, produces on the stomach, bowels, and kidneys, an action far different from that of the subcarbonate or the sulphate; and so of the other preparations. Besides, in a disease which generally requires for its cure a prolonged course, it is no small advantage both to vary the preparation, and to be enabled to administer it in a palatable form. The acetated tincture of iron, a formula for which we are indebted to the late Dr. Percival, of this city, is, when carefully prepared and well preserved, a valuable medicine; given in asses' milk, or in cows' milk, divested of its curd, it may be easily taken, and long persevered in.

The wine of iron, an old preparation, is one sometimes to be preferred, and may be given in the same manner as the acetated tincture. It is mild in its action, and very suitable for children. The wine of iron and rhubarb is, in many instances, a compound productive of excellent effects. The combinations of iron with ammonia are extremely useful; ammonia forms an important adjunct in the treatment of many cases of this disease, particularly those which are characterised by distressing coldness of the extremities. Mr. Bewley's effervescing chalybeate is a very eligible preparation, and applicable to many cases; impregnated as it is with fixed air, it is grateful both to the palate and to the stomach. The following formula I have also found suitable to many cases; water of the citrate of ammonia, three drachms; water, six drachms; syrup, a drachm; citrate of iron and quinine, from one to three grains:—mix, for a draught to be taken twice or thrice daily.

In both chlorosis an anæmia, I have observed that the treatment has been rendered more certainly, and more speedily effective, by administering iron in conjunction with Peruvian bark and the salts derived from it. Hence arises the value of the triple salt just named; hence also the efficacy of the aromatic iron mixture, which, when united in equal proportions with Griffith's mixture, constitutes a very useful compound. I have often prescribed—and I think with excellent results—bark, iron, and ammonia, conjointly in the following manner:—Decoction of Peruvian bark, ten drachms; tincture of bitter orange peel, one drachm; syrup of ginger, one drachm; bicarbonate of ammonia, fifteen grains. Mix. To be taken two, three, or four times daily, in effervescence, with half an ounce of lemon-juice. The compound iron pill, so prepared as to insure its solubility in the stomach, and repeated in sufficient doses three or four times daily, with the addition of about half a grain of sulphate of quinine—which, though an unchemical formula, increases much the efficacy of the compound—forms one of the most generally and certainly effective modes of administering iron. In pill it is less likely to produce headache, than in solution; and for those who can with facility swallow pills, this mode of introducing iron into the system is at once more easy, and admits without causing disgust, of being longer continued. The saccharine proto-carbonate, diffused in a vegetable bitter, is also an excellent chalybeate. In cases which require a mild aperient, in co-operation with the chalybeate, I have found the following powders particularly useful:—Bicarbonate of soda, fifteen grains; tartaric acid, ten grains; powdered white sugar, half a drachm. This powder should be kept in a dry place, dissolved in a wine-glassful of water, and swallowed whilst effervescing. These powders I have been in the habit of prescribing for the last ten years; they were first prepared for me by the late Mr. Fergusson, of Kildare-street. I saw lately in a periodical a good formula for this powder, and very similar to the one now given. As a general rule—to which, however, there are some exceptions—iron should be given in small doses. Some of the natural chalybeate springs, which possess remarkable restorative properties, hold extremely minute quantities of iron in solution,—a hint derived from nature, which we may often advantageously adopt.

The effect of iron in changing the colour of the fæces is so well known that it is unnecessary to dwell upon it; it is also capable of producing an alteration in the aspect and properties of the urine. In proportion as the amount of red corpuscles in the blood is increased by the use of iron, change of air, or other remedies of a tonic nature, so is the quantity of urea and uric acid in the urine augmented. If the chalybeate treatment be too long persevered in, it may lead to and establish a condition of the system directly the reverse of that for which it was originally prescribed. Some time since I saw a young lady, whom, several months previously, I had treated for distinctly characterized and extreme chlorosis. In the interim she had gone to the country, had travelled, and had persevered in the chalybeate treatment for many weeks after the chlorotic symptoms had disappeared. When I saw her, I found her in a totally opposite state, complaining of flushings, headache, red pimples, and a deeply florid colour of the face. Such were the symptoms, which now troubled her far more than her former death-like pallor, and for which she more anxiously sought a remedy. The transition, in her case, was striking; she had been chlorotic, she was now hyperæmic; the red corpuscles, which had been minus, were now become plus. Of this transition I have met with several well-marked instances. A change having taken place in the condition of the blood, the treatment should likewise be changed, since the remedies necessary to ameliorate the condition of the blood in chlorosis, if too long persevered in, may originate an opposite and equally injurious state of the system. The truth of this remark is exemplified in the individuals who, by profuse hemorrhage, are reduced to the chlorotic state. In many of these instances (in females, from uterine hemorrhage; in males, from long-continued hemorrhoidal bleeding; and in both, from profuse epistaxis) the blood is so thinned that iron becomes the efficient remedy; but if continued too long, hemorrhage is reproduced.

Having dwelt upon the effects of iron, and upon some of the formulæ for its administration, the inquiry suggests itself, Do we possess any medicine capable of diminishing the amount of red corpuscles, when in excess, of equal efficacy with iron (whatever be its mode of action) in augmenting their quantity when deficient? Can we, in fact, take away from the richness of the blood with the same certainty that we can add to it? Obviously by bleeding, abstemiousness, and evacuations, the whole mass of the blood may be attenuated and impoverished: by these means, however, the blood is not only deprived of its red corpuscles, but all its constituents are wasted, and the object of diminishing the proportion of red corpuscles alone is not attained. Now this is a very interesting inquiry, and merits the fullest consideration. I shall merely touch upon it at present, and reserve more extended observations respecting it until we shall have spoken of the various forms of hemorrhage. I cannot, however, avoid noticing some remarks which have been made on this subject by Dr. Freke, the clinical clerk to our medical wards, to whom I am indebted for much valuable aid in our researches in Stevens's Hospital, and whose accurate and extensive knowledge of organic chemistry is of great value in the investigation of the phenomena of disease, and its treatment.

In the year 1843, Dr. Freke published in the *Medical Times* the following inquiries:—"Would it not, then, be of importance if any means could be suggested whereby the red globules alone might be diminished, while the other constituents of the blood remained unaffected? Could this be accomplished by the *hydro-sulphuret of ammonia?*" He then proceeds to express his belief in the twofold possibility that such end might be effected, and that the hydro-sulphuret of ammonia might be possessed of the power of depriving the red globules of an essential constituent, "appropriating to itself a portion of that iron which would otherwise have contributed to the formation of the red globules." His grounds for such belief were, conjointly, the known affinity between iron and sulphur, the observed effects of hydro-sulphuret of ammonia on the economy, and the supposed function of iron in the globules. In the last number of the same periodical appeared an article, headed, "Researches on the Human Blood," by M. Bonnet, of Lyons, the concluding

paragraph of which is as follows:—"M. Bonnet has further remarked that the hydro-sulphuret of ammonia destroys the globules completely, and deprives the blood of the faculty of assuming the bright scarlet colour of arterialization." Thus the suggestion put forward by Dr. Freke three years ago has been in a measure confirmed by the recent researches of M. Bonnet. This important practical inquiry requires further investigation; it may lead to valuable results. Whether hydro-sulphuret of ammonia acts primarily on the nervous system, as a sedative poison, or its direct effect be to de-arterialize the blood, still, as a medicine, given in well regulated doses, it may yet be found to possess curative properties.

In the second number of the *Dublin Medical Journal*, May, 1832, a case of disease of the heart was published, at my request, by my late friend Dr. Newton, in which the hydro-sulphuret of ammonia having been administered, the heart's action was reduced to forty-eight in the minute, with an abatement of all the urgent symptoms. In other cases, too, the influence of this medicine upon the heart and pulse were very remarkable. I was led to adopt this practice by the accounts given of it by Dr. Rollo, in his work on "Diabetes." I may further observe, that I have been for many years in the habit of prescribing the hydro-sulphuret of lime in the treatment of diseases of the skin. I have employed it internally, in doses of from ten to thirty drops, sufficiently diluted; and externally, in the form of vapour, of lotion, and of liniment. I have reason to speak very favourably of its effects, more especially in those cases in which, from appearances at least, we should be induced to expect an excess of the red corpuscles. Might not its action be similar to that of the hydro-sulphuret of ammonia?—and might not this investigation, if fully carried out, throw a clearer light upon the manner in which the sulphureous waters of Lucan, Harrogate, Aix-la-Chapelle, &c. and the various preparations of sulphur, influence the animal economy. The inquiry is one of interest, and involves the consideration of the treatment of a large proportion of cutaneous affections.

Before dismissing the subject of chlorosis we must notice the opinion entertained by some, that there is a close relation between the functions of the great sympathetic nerve and the symptoms of chlorosis. There are, undoubtedly, strong grounds for the opinion. The ganglionic system of nerves, termed the sympathetic, exercises so paramount an influence over digestion, absorption, deposition, secretion, circulation, respiration, and reproduction, that we cannot but conclude that many of the phenomena of chlorosis are traceable to a primary derangement in the function of this important and widely distributed nerve. I find that Dr. Hill has made some remarks on this subject, and written a sketch of the anatomy and functions of the sympathetic nerve, and its intimate connexion with the essential symptoms of chlorosis, which, when completed, shall be laid before the profession. We have noted, and have on record, a large number of cases, both of chlorosis, and of hemorrhage, in which the blood has been carefully examined; these, in a condensed form, shall be given after the subject of hemorrhage shall have been treated of.

To Dr. Hill I am deeply indebted for his energetic co-operation in all these investigations: without the aid of his talents, industry, and perseverance, I could never have prosecuted these inquiries.

It is to be regretted that hitherto our investigations have been restricted to venous blood, the opportunities of examining arterial blood being rare indeed.

In the use I have made of the term anæmia, I wish it to be understood that it is intended to imply a diminution in the density of the blood, with pallor and debility, without any reference to its quantity, which may be either augmented or diminished.—*Medical Press and Circular, March* 6, 1867, *p.* 213.

22.—ON EPISTAXIS.

By Sir Henry Marsh, M.D., Bart., Physician in Ordinary to the Queen in Ireland.

Close observation of the natural process by which this exudation is effected, affords much useful instruction, and teaches us what the true nature is, of many of those internal and unseen hemorrhages, which formerly, and still are popularly, referred to the rupture of the trunk of a blood-vessel. This, doubtless, is the occasional, but comparatively rare, cause of a fatal hemorrhage. The most frequent cause of hemorrhages, often fatally profuse, is,—as may be observed in epistaxis, capillary exudation,—blood extravasated, not from an arterial or venous trunk, but, from myriads of turgid capillary and exhaling vessels.

A remarkable case, elucidating this truth, occurred at Steevens's Hospital. A young man, labouring under hemoptysis, was admitted a few hours before my morning visit. Having spoken to, examined, and prescribed for him, I passed on. Whilst talking to the patient who lay in the next bed, I heard a gurgling sound and turned round: the man to whom I had but a moment before been speaking was dead,—was suffocated. A minute and careful examination disclosed neither tubercle, nor cavity, nor consolidation, nor lobular nor diffuse apoplexy, nor ruptured trunk, in any part of the parenchyma of the lungs; all the larger bronchi were nearly filled with blood, which was coagulated in them, particularly at and about the bifurcation, so as to obstruct the ingress of air. It was a case of bronchial hemorrhage,—of copious sweating of blood from innumerable capillary tubes distended with blood. I say sweating, because I doubt there being any rupture or breach of surface.

In some forms of fever, sweating so profuse has occurred as to soak through the bed, and to accumulate in large quantities in a vessel placed underneath.

A capillary extravasation of red blood may be as profuse as a capillary exudation of white blood. A mucous membrane may copiously sweat blood; I have seen the same thing happen from the pores of the external skin of the face. One case, a very remarkable one, I shall briefly refer to. The patient was a young woman four or five-and-twenty years of age; herself intensely strumous, as were also her parents and brothers; she was subject early in life, both before and after puberty, to spontaneous epistaxis. She was attacked with fever. The symptoms presented the usual aspect of scarlatina; a dusky red rash was universally diffused, with sore and swollen throat, but no ulceration. There was a well-marked febrile movement in the system. On the third day the whole characters of the case were altered; fever subsided, the throat was no longer complained of. Quite suddenly petechiæ, some very small, some as large as a split pea, appeared under the cuticle, and were rapidly scattered over the whole surface; their colour was livid, and they soon became black as ink. After the lapse of a few days dark grumous blood began to ooze from the gums, from all the points of junction of the internal and external skins, and from the nares, and appeared mixed with the urine and fæces; patches of ecchymosis stained the skin over large spaces. The debility, vascular and muscular, was extreme, and the fetor emanating from the breath and whole person in the highest degree offensive. All signs of scarlatina vanished.

In this miserable state, with a gradual augmentation of every worst symptom of purpura hemorrhagica in its most malignant form, she lingered on for nearly three weeks.

For many days before death the following remarkable phenomena manifested itself. Blood oozed and descended in streams from the pores of the skin of the face, and, of all the external skin, from those of the face only. With intense interest I watched the process. The surface having been wiped clean, minute globules of dark blood were seen to exude from every pore; these rapidly increased in size, coalesced, and formed streams which flowed on every side; a profusion of blood was thus extravasated, in like

manner as drops of rain increase in size in descending, unite, and form tortuous little rivers, on the glass of a window of a carriage.

Whether attributable to the great tenuity of the Schneiderian membrane, connected with the delicacy of the sense of smell, or to the highly vascular network of this membrane, or to the copiousness of the supply of blood to the brain, or to all unitedly, certain it is, that of all the hemorrhages, that most frequent of occurrence is epistaxis.

To this variety of hemorrhage some are much more prone than others, and this may depend not only on constitutional causes, such, for example, as mal-organized blood, but also upon superior delicacy of the mucous membrane and its vessels; a condition of mucous membrane, as well as of external skin, frequently characteristic of struma. Whatever be the cause the fact is certain, that blood streams from the nares with more facility than from any other mucous surfaces.

This is the case, in varied degrees, at every period of life, but much more remarkably so at the extremes of life; the most frequent time of occurrence of epistaxis is, however, during the period of growth. I have many interesting cases recorded which prove that this hemorrhage, having appeared in early youth, disappears during mediæval life, and returns as years accumulate and old age approaches. The period of senility varies much in differently constituted individuals, and is hastened or retarded by the events and habits of the past life.

It is a curious fact that the epistaxis of the growing period of life should, in so many instances, resume its sway towards its close. It may be termed the *Epistaxis redux* of advanced age. Within the last few days I attended a lady, now in her seventy-fourth year, affected with severe hemoptysis. Thrice before, several weeks having intervened, she was similarly affected, and twice, previously to the attacks of hemoptysis, she bled profusely from the nose. Inquiry elicited the following facts: In early life, antecedent to the full establishment of the catamenia, she had been a martyr to idiopathic epistaxis; at the menstruating periods she suffered habitually much pain, and the discharges were very profuse, and at the period of the cessation of the menses, when they recurred at long and irregular intervals, the hemorrhage was excessive, and the blood came down in large clots. She had been married at a young age, but had never been pregnant. This old lady does not appear to labour under any organic disease; the heart's action and the breath-sounds are perfectly normal. I have on record several equivalent cases.

Considering, then, the facility with which blood is exuded from the nares, it is not contrary to anticipation that mental emotions should so affect the vessels of the brain, as frequently to give rise to epistaxis. Congestions, inflammations, and diseases of the brain are frequently preceded and accompanied by epistaxis; this I shall have occasion hereafter more particularly to notice. Those mental emotions which produce cerebral congestion (for some, not all, produce this effect), are often signalised, and relieved too, by a flow of blood from the nares. Epistaxis is thus often a naturally provided safety-valve. The following event, of which I happened to be an eye-witness, illustrates this principle. A child some two and a half or three years of age, in attempting to descend a flight of stairs, fell, and rolled down to the first landing place. He was much hurt, and cried bitterly. The nurse, a strong plethoric woman, greatly attached to the child, ran to take him in her arms; the child's father, at the head of the stairs, sternly forbade her to touch him; she was compelled (standing at the foot of the stairs) to look on. Another attempt (after many efforts and touching appeals for help) was made by the child to descend. Again, he fell. The nurse could endure it no longer; her feelings overpowered her. She rushed up stairs and took him in her arms, and exclaimed, in a highly excited tone, "If it cost her her life she would save the child." She became deeply flushed, and a copious stream of blood rushed from both nostrils. This woman, whom I had frequent opportunity of afterwards seeing, had never been subject, previously or since, to any form or variety of abnormal hemorrhage. This was a well-marked instance of a strong mental emotion causing epistaxis of temporary origin, and altogether

exempted from any pre-existing or hereditary hemorrhagic diathesis. I shall, on a future occasion, notice how frequently this diathesis, connected with struma, is hereditary.

A lady, in her fortieth year, of florid complexion, and uncontrolled temper, in a fit of furious and unrestrained anger, was seized with epistaxis. Blood from both nostrils flowed in profusion, and persisted so long that her family became seriously alarmed. When I saw her she was nearly pulseless; there was a death-like pallor present, and a cold, clammy, perspiration; her voice was feeble, and she could articulate only in a whisper, yet she did not appear to be alarmed. There was no time to be lost; much blood still flowed; much descended from the posterior nares, and was swallowed; some hours previously she had vomited blood. Antecedent to my visit, all the usual means to check the blood-flow had been in vain employed. Upon close examination it was ascertained that the flow of blood was much more profuse from the left than from the right nostril; by means of a flexible catheter passed along the floor of the nose, a plug, with a strong silk thread firmly attached, was, through the mouth, introduced into the left posterior nostril. This completely controlled the blood-flow at that side; as it was not desirable too suddenly wholly to arrest the bleeding, the other nostril was not plugged. The loss on the right side became now comparatively small.

So much distress, so many unpleasant consequences have occasionally arisen from the plugging of both nostrils, that, whenever practicable, one of the air passages should be left free. The double plug is often needlessly applied. Sometimes, however, it is unavoidable. It may be well to remark, that if sponge be used for a plug, it is better to enclose it in lint, otherwise when distended by moisture, it may so insinuate itself into the narrow spaces between the delicate bones of the nose, as to cause difficulty and even injury in its removal.

Months elapsed ere this lady recovered in health, strength, and complexion, from this profuse and prolonged nasal hemorrhage. In early life she had been subject to idiopathic epistaxis; her menses were always superabundant, sometimes extremely profuse. At each of her confinements her losses of blood were enormous. About a week before the attack of epistaxis she had menstruated copiously. Her habits of life had always been temperate. Thus in this case, a fit of anger, or rather of fury, was the exciting cause of the epistaxis. But its dangerous profusion is to be attributed to the pre-existence of a well-marked hemorrhagic diathesis.

The leading facts of another somewhat similar case shall be briefly detailed.

Mrs. S., aged 49, has ceased for a year and a half to menstruate. She is now laboring under organic disease of the heart. The symptoms indicate the existence of contracted orifice of the mitral valve. She has had two severe attacks of rheumatic fever, one before puberty, one at the age of 26. Eight years have elapsed since she first complained of dyspnœa and palpitation. Thirteen years ago she sustained a severe mental shock, by the sudden and unexpected death of her mother, to whom she was fondly and devotedly attached; the more, perhaps, because, though long married, she was childless. The mental emotion produced by the suddenly imparted news of her mother's death was very great, she was seized with violent headache, which was followed by most profuse epistaxis; for three days the hemorrhage never ceased. She lived in a remote part of the west of Ireland, and it was not until the fourth morning after the commencement of the attack that the physician reached her house; he found her pulseless, and apparently dying. He plugged both nostrils; she was unable to articulate, and with difficulty could swallow; she lay for upwards of three weeks in a state of insensibility; this period of time was a blank in her existence. She slowly recovered, but her natural complexion, vigor, and strength, she has never since then repossessed. In her case it is especially remarkable that, from the earliest age up to the full period of puberty, she had been subject to idiopathic epistaxis, so much so as to interfere with all her girlish amusements and occupations. The flow of blood was never during her early life profuse, but occurred so frequently.

sometimes spontaneously, sometimes from the slightest causes, that she lived in a state of perpetual apprehension. When the menses were fully established the epistaxis ceased, and did not again recur till, as related, a powerful mental emotion recalled the latent predisposition, and accounted for its all but fatal persistence and profusion.

In the pages of history we meet with several instances of hemorrhage produced by the most overwhelming of mental influences: wounded pride, thwarted and disappointed ambition. A Doge of Venice burst, as is narrated, a blood-vessel, and died suddenly, when he heard the bell of St. Mark's announce by its toll the appointment of his successor. At Salisbury, the perverse, mentally blind, and unfortunate monarch of England, James II., was, on the eve of an expected battle, which he never fought, seized with epistaxis. It continued, and confined him to bed, for three days.

The influence of augmented heat or caloric upon the cerebral circulation, becomes a frequent cause of temporarily excited epistaxis. Hence it is that, at the hottest seasons of the year, hemorrhages in our climate are most frequent. Hence also it is that an overheated bath, heated rooms, indulgence in ardent spirits, the sun-stroke, violent exercises, so affect the circulation that hemorrhages oftentimes immediately ensue. Intense thought, long persisted in, renders the vessels of the brain turgid, and gives rise to a blood-flow,

Hence, too, the great imprudence and injury of ordering those patients threatened with phthisis, who evince the hemorrhagic diathesis, to overheated and dry climates; those who labour under what I have elsewhere termed hemorrhagic phthisis should never be sent to a climate which tends directly to augment the existing and often fatal evil.

Those causes which suddenly excite and stimulate the heart's action, so as to propel blood more rapidly to the brain, do, in many persons, give rise to epistaxis. In fevers, at the commencement of the stage of reaction, this is especially and strongly exemplified. A flow of blood from the nares is the starting-point of many fevers, of none more frequently than the Rebeolous.

Some months since I happened to attend two boys, each about ten years old, in the same room. They were playfellows and companions, but not relatives. I was much struck by the contrast between these two cases. One possessed a sound constitution, free from any hereditary taint, and had never been affected with idiopathic epistaxis. The other had not long recovered from a tedious and prolonged succession of strumous abscesses of the cervical glands, which left characteristic and deforming scars and cicatrices. From infancy he had been prone to distressing and perpetually recurring attacks of epistaxis. Twice the blood-flow was seriously profuse. Both these boys were attacked, within a few days of each other, with measles. At the time when the rash was beginning to appear they both complained of headache, and they both bled from the nose; the boy with untainted constitution had no recurrence of the bleeding, was greatly relieved by it, and passed through the disease without one untoward symptom; the boy who was marked with the signs of struma (both his parents were intensely strumous) during three days bled so frequently, so copiously, that his life was endangered. The former was in a few days perfectly restored; but months elapsed ere he who was marked with struma resumed his former ruddy and deceptive appearance of health.

Thus were evinced, in strongly contrasted relief, the temporary and salutary epistaxis of a perfect constitution, and the protracted and exhausting epistaxis of the distinctly impressed strumo-hemorrhagic diathesis.

Here it may be noticed how very distinct the hemorrhage of incoming fever is from that which takes place towards its close. Epistaxis is the most frequent variety of bleeding during the hot stage; intestinal, sometimes uterine, when the fever is advanced; and when, at this stage, it or any other variety of hemorrhage, sets in profusely, it is a most formidable symptom, and indicates the great change which has been wrought by continued febrile action in the component ingredients and constituency of the blood. At the

ingress of the reaction of fever no material change has as yet been produced; towards the close the blood has been thinned and altered.

Of all the signs of the febrile movement the most invariable is wasting. No matter what the type, this is the most uniform result. Scanty are the supplies; the primary assimilative function is, in a great measure, suspended; so must be that of sanguification. The body feeds upon itself; as fever progresses, the blood becomes more and more attenuated; and in those fevers which are caused by malaria and by animal and other poisons, the blood becomes so deteriorated, so reduced in tenacity and density, that it oozes and is exhaled from mucous surfaces. Thus a passive hemorrhage is produced, altogether distinct from the active hemorrhage which so frequently, at the incoming of fever, relieves the tension and increased action of the vessels of the brain.—*Medical Press and Circular, March* 20, 1867, *p.* 267.

23.—ON THE DIAGNOSIS OF OBSTRUCTIVE MITRAL BY A PRE-SYSTOLIC BRUIT.

By Dr. Peacock.

[The following is an extract of a paper read by Dr. Peacock before the Hunterian Society.]

Dr. Peacock stated his former disbelief in the existence of any such murmur, except, it might be, in rare cases, but subsequent inquiry had led him to modify his views to a considerable extent. He narrated a case in which he had been able to make out a distinct presystolic bruit during life, and on examination after death he found well-marked mitral constriction, together with vegetations on the auricular surface of the valves. In the lungs a number of apoplectic kernels of various ages were discovered. Dr. Peacock had found these bruits to exist either with or without a systolic murmur, but, in some cases, and especially when associated with the last, their detection was very difficult, and the diagnosis of mitral obstruction by physical signs alone uncertain. It might, however, be made out by the fact that the burden of the work was thrown upon the right side of the heart, which beat louder than usual, by the tremor which sometimes accompanied the contact of the apex of the heart with the side, and by the pulse, which, as the left ventricle was unaffected but the supply of blood limited, was small and quick, but regular. The condition of the lungs is also different; the onset of the disease being more gradual than in regurgitation, the pulmonary capillaries have time to distend; hence the dyspnœa is less. There is less general venous engorgement, so that there is less dropsy, and that mostly in the lower extremities; the face is also usually paler. The prognosis is better than in mitral regurgitation, although in neither did he consider it so bad as was sometimes stated, and in both it was better than in aortic regurgitation. The treatment of the two mitral affections was rather different. In the case of obstruction, the patient was usually anæmic, and the circulation was with difficulty maintained; therefore tonics, especially chalybeates, were specially indicated. In regurgitation, again, the symptoms were generally more urgent, and the accumulated fluid had to be removed by diuretics or cathartics. Some patients lived a very long time with contracted mitral, especially young people who might have been born so, or acquired the condition soon after birth. As for himself, he was inclined to believe that rheumatism as a cause of heart complaint had been over-estimated.—*Medical Times and Gazette, Feb.* 2, 1867, *p.* 131.

DISEASES OF THE ORGANS OF RESPIRATION.

24.—WHAT IS TUBERCLE?

By the Editor of the Medical Times and Gazette.

[The following article was elicited by a debate at the Pathological Society, on the evening of the second of April.]

Originally, of course, the word tubercle bore with it no distinct meaning beyond the idea of a small tumour; but Laennec, applying it to the diseased condition so often encountered in the lungs, spoke of tubercular granulations and infiltrations, in the latter term departing entirely from the original idea of tubercle, beside bestowing upon it a character of specificity. What then was this specific product, for there were and are recognized two varieties of tubercle—the grey or miliary, and the yellow or crude? According to Bayle, the grey granulations were non-tubercular; Laennec, on the other hand, regarded them as essentially so—in fact, the invariable precursors of the yellow or crude variety of tubercle; whilst most moderns look upon them as the only correct representatives of that substance. Until lately Laennec's view has been the one accepted in this country, yellow tubercle being looked upon as the ultimate result of the miliary, although by many the cheesy stage was accepted as a starting-point for the interpretation of the whole process of tuberculisation. Miliary tubercle was supposed to be the result of inflammation and consequent exudation, but, the blood being vitiated and the constitution depraved, the effused product assumed this imperfect form instead of that ordinarily investing healthy lymph. The granular tubercles thus formed were supposed to be incapable of reproducing themselves, having no power of cell formation, and consequently only increasing by accretion. They involved none of the surrounding tissues, only appearing to affect them as any foreign body would, whilst, being gifted with but a lowly organisation, they were extremely liable to degeneration. In this way the large cheesy masses encountered in the lung were supposed to be produced, and these masses were by many accepted as the true representative of tubercle. Still, till recently, no one doubted the accuracy of the views just cited, but two great blows were struck, and the stability of these doctrines, thus roughly tested, was found to be deficient. Probably the first of these in point of time was the discovery that the cheesy mass constituting crude tubercle was very far from being invariably of a tuberculous nature; in fact, after a certain stage, it could not be made out whether the mass had been originally tubercular, or was the degenerate remains of pus, cancer, sarcoma, or pneumonic deposits. The other was Virchow's discovery of the history of tubercle, and his tracing it through all its stages, from its earliest origin in connective-tissue cells, to its final softening and expulsion. By the former, the unfailing certainty with which any cheesy mass encountered in the lungs or elsewhere was pronounced tubercular, was rudely dispelled; by the latter the inflammatory and exudative origin of tubercle was treated in a similarly summary manner. As a further consequence of the discovery of the essentially cellular nature of tubercle, its type is no longer sought for in its commonest situation, the lungs, but in other organs whose constituents are of a less perplexing character—as, for instance, in serous membranes. There the proliferation of badly formed and nourished connective-tissue cells may be readily observed, their products assuming that shrivelled, unwholesome, and granular aspect seen in tubercle. One situation seems to be peculiarly well adapted for examining the growth of tubercle—that is, the lining membranes of the skull and coverings of the brain; yet many French observers, including no less an authority than Robin, hampered by the old notions as to the cheesy nature of tubercle, refuse to accept the bodies produced there as tubercular. Recent researches by Dr. Bastian as to the origin and growth of tubercle in that situation would seem to prove that meningeal tubercle does not originate from connective-tissue corpuscles, but rather by the excessive proliferation of the epithelial cells and nuclei lining a series of peri-vascular canals which have been demonstrated by him to surround the vessels of the brain and meninges. There the process of proliferation goes on at an increased rate, but for want of proper nourishment the cells become worse and worse formed, and their contents more and more granular, until the mass almost entirely loses its cellular character. There is no exudation, but the deteriorated quality of the blood influences the process so far as to give rise to a granular instead of a cellular product. Is this, then, inflammation? Essentially it is, for according to the doctrines

of the new school, inflammation only consists in excessive proliferation of cells, accompanied by certain manifestations of local and general disturbance.

But of late the matter has assumed an entirely new aspect by the experiments of M. Villemin. Investigating the history of tubercle, and seeking some more satisfactory information as to its origin than had hitherto been given, M. Villemin was induced to try the effects of inoculation. A small quantity of that substance was introduced into a little wound behind the ear of a rabbit, and the opening closed. When examined, tubercle of the grey or miliary kind was found in various parts of the body, particularly in the lungs. The experiments were repeated again and again, but in all cases with a like result, and M. Villemin came to the conclusion that tubercle was thus transmissible from one being to another. Other experimenters came forward, among them the famed Lebert, who also confirmed Villemin's results. The attention of many of our indefatigable pathologists being thus drawn to the investigation, they, being far from satisfied with the accuracy of the experiments, resolved to undertake fresh ones for themselves. Among others, Mr. J. Simon and Dr. Andrew Clark had been working at the subject, and both laid their results before the Pathological Society. In some very important particulars Mr. Simon's results differ from those of previous investigators. Thus he made use of yellow or crude tubercle, a product which, as we have already seen, is of by no means a certain origin; even of this he used but a very small quantity, which was introduced into a wound of, comparatively speaking, a small size; further, the substance produced possessed more of the characters of crude than of miliary tubercle, and this was found in various parts of the body.

Dr. Andrew Clark had made use of grey tubercle, and had succeeded in producing something resembling grey or miliary tubercle, but which he maintained had altogether a different structure, being distinctly cellular in its texture and having characters identical with the products of lobular or epithelial pneumonia. This product, he maintained, had not the same destructive influence on life as tubercle in the human subject had, and as to its being miliary tubercle, the eye alone was not a sufficient test. But by far the most important point was that *he had been able to produce similar matter by inoculating with substances of a non-tuberculous nature*, as cancer and pus. Further, he argued, were tubercle so readily transmissable, why did we not more frequently find the husband infect the wife, and *vice versa?* And so the matter rests.

Shortly, the facts may be stated thus:—The true or miliary form of tubercle seems invariably to originate by the proliferation of certain cells, the products, from the vitiated condition of the blood, being more or less imperfect (Virchow, Vulpian, Bastian). Some local stimulus is, however, wanting in addition to the ordinarily deteriorated state of the constitution, and this may be supplied by the introduction of miliary tubercle (Villemin, &c.), by crude tubercle (Simon), or other morbid substances (Clark), into the system. The products of the cell proliferation would seem, however, probably from the healthy condition of the animal, to possess more of a cellular and less of a granular character than in man (Clark). It is obviously foolish to talk of the product of Mr. Simon's experiments as crude tubercle—a decaying or degenerating substance; it may have been of the nature of miliary tubercle originally, or it may not; but to suppose that this half-dead matter was the *immediate* result of introducing other half-dead matter into the system is absurd.

Stripped of all garnishing, these are the facts. As yet they are too scanty in number to allow of any extensive generalisation; but the field is now filled with able and willing workers, and we hope that before long the veil will be raised still further, and we shall have a nearer insight into this most interesting morbid process.—*Medical Times and Gazette, April* 20, 1867, *p.* 414.

25.—ON GOUTY BRONCHITIS.

By Dr. E. Headlam Greenhow, Assistant-Physician to the Middlesex Hospital.

[In a large proportion of cases bronchitis is a secondary, not a primary disease. There is evidently some relation between the gouty diathesis and bronchitis; for out of ninety-six cases of the latter a distinct gouty history could be traced in thirty-four.]

A more minute investigation of the facts bearing on this subject will now, however, be desirable. First, then, as regards the patients themselves. I find that no less than fourteen were subject to attacks of acute regular gout as well as to bronchitis, and that in nine of these cases gout co-existed with the bronchitis while the patients were under my care. Eleven others had suffered from chronic gout attended by the formation of chalk-stones, or from what has been called rheumatic gout. I am indeed aware that some of our most eminent authorities consider regular gout and rheumatic gout as entirely different complaints; but I have so frequently seen rheumatic gout in persons some of whose immediate relatives suffered from regular gout, that I have no hesitation in regarding them as at least closely allied diseases. In the cases of nine other patients who had not themselves shown any symptoms of gout, it was ascertained that near relatives, such as parents, brothers, or sisters, had suffered from that disease; and this number, probably, by no means, represents the true proportion of such cases, for, as you will remember, the family history could not be made out in much more than half the ninety-six cases analysed. These three numbers, however, fourteen, eleven, and nine, make up the thirty-four cases which I mentioned as showing the intimate relation between a gouty constitution and chronic bronchitis. The evidence on this head is, I think, strengthened by the fact that, in many instances, while some members of the patients' families had gout, others had bronchitis, and others again suffered from both complaints. Confining myself strictly to those cases in which there had been acute regular gout, I clearly ascertained the existence of both gout and bronchitis in ten of my patients' families. Thus in one instance two near blood relatives of the patient were subject to gout, and one other, as well as the patient, to bronchitis; in another case three were subject to gout, and one to bronchitis; in a third family, one member had suffered from gout, and five from bronchitis; and in a fourth, two from gout and three from bronchitis. In five other of the ten families, at least one member had suffered from both gout and bronchitis; the patient under my care being, of course, in all cases excluded from the reckoning, and no two of the cases included in my analysis having been members of the same family.

It is, indeed, true that the gouty form of dyscrasia is exceedingly common, not only among private patients, but also among the working classes, and especially among the artisans of London, who frequent our hospital out-patient rooms. But, common as it is, gout constitutes, even when the regular, the irregular, and the complicated forms are all thrown into the calculation, a very much smaller proportion of the total number of our hospital patients than it does of the bronchitis class only. Hence I think myself justified in the conclusion, to which personal observation has also led me, that there really is the intimate relation between a gouty constitution and chronic bronchitis which I have frequently taught you, and that in many cases in which, from active and temperate habits, or from some other cause, a hereditary tendency to gout has not been developed into the characteristic form of that disease, it has manifested itself in the form of chronic bronchitis.

In further support of these views, I may mention that I have frequently known bronchitis and gout alternate; an obstinate attack of bronchitis subsiding on the occurrence of a smart fit of gout, and, though less frequently, *vice versâ*—bronchitis being developed on the subsidence of gout. I well recollect a striking example of this alternation in the case of an elderly man who was long under my care. His ailments were gout, psoriasis, and bronchitis, and he was rarely or never free from all of them. No two of the three

ailments ever co-existed in his case; but it would happen that just as he was congratulating himself on having got rid of the gout, his skin would become covered with psoriasis, and this in a few weeks would take its departure, and be succeeded by an attack of bronchitis.

I have dwelt at considerable length upon this, as I am convinced, very frequent constitutional origin of bronchitis, because its recognition affords the clue to the successful treatment of the disease in many cases; and although it has been mentioned in express terms by Sir Henry Holland and several other eminent physicians, it has never, I think, been so prominently or specifically brought forward as to secure for it in ordinary medical pactice the attention its importance deserves. I shall now proceed further to illustrate my remarks on this subject by reading to you several instructive cases, which I have selected from among the number included in my analysis, and which may fairly be classed under the head of gouty bronchitis.

The first case is that of a man who was only a short time under observation, and whose family history I could not obtain; but I have chosen it as affording a more than usually obvious illustration of the relation between gout and bronchitis in an individual patient. In the greater number of cases the secondary character of bronchitis is to be inferred rather from the history of the case of the patient's family than from present facts patent to the observer; and I have endeavored to make the relation between gout and bronchitis apparent to you, chiefly, by showing the very large proportion of bronchitic patients in whom, or in whose families, I have found a more or less definite history of gout. In many cases, no doubt, the gouty dyscrasia only produces a strong predisposition to bronchitis, and the disease is first developed by some external exciting cause, though frequently by a much slighter one than would be likely to produce the same effect in a healthy subject. In other cases, again, we find in gouty constitutions a certain degree of chronic bronchial irritation manifested by more or less constant scanty expectoration, which either merges slowly and almost imperceptibly, as life advances, into chronic bronchitis, or is more rapidly developed into it by exposure to vicissitudes of temperature or other immediate exciting causes. In the case I am about to relate, however, the patient had not only himself suffered from definite attacks of both gout and bronchitis, but he did not refer his bronchial symptoms to any exposure, and considered them as merely the sequelæ of his gouty attacks, which they immediately followed and appeared to supersede. This, in fact, occurred, as the following brief history will show, on occasion of the attack for which he came under my care:

H. T——, aged forty-eight, a pallid, sallow-complexioned man, by occupation a tailor, was admitted an out-patient on the 12th of January, 1866. He stated that he had for several years suffered from occasional attacks of regular gout, always commencing in the ball of the great toe. After the gout he had also been subject to what he called asthmatical attacks, and during the previous winter had suffered for some time from cough. Somewhat more than a fortnight before presenting himself at the hospital he had been attacked by gouty pains in the knee, foot, and left elbow, accompanied by severe headache. In the course of a few days, these pains had entirely subsided, except in the elbow, and simultaneously with their disappearance he had begun to suffer from cough and dyspnœa.

On admission, he complained much of the dyspnœa, especially on rising in the morning, and on moving about, and said that the cough was attended by a copious, thick, white expectoration. The left elbow was still hot, swollen, and tender; the skin was moderately warm; pulse 90; urine normal; the chest was everywhere resonant on percussion, indeed abnormally clear in both mammary regions, and posteriorly over the lower lobe of the left lung; the respiration was slightly laborious; the expiration prolonged, and loud cooing sounds were audible over both lungs; the cardiac sounds were free from murmur, but the area of cardiac dulness was increased, and the heart's impulse was more diffused than in the state of health. I gave the patient at first the compound squill draught during the day, and a pill consisting of two grains of the acetic extract of colchicum and three of Dover's powder each

night at bed-time. Under this treatment he rapidly improved; the gouty symptoms in the elbow disappeared almost immediately, and the cough and expectoration soon greatly abated. He still, however, suffered from dyspnœa, and, as there is emphysema in both lungs, he will probably continue to do so more or less as long as he lives.

But I need not detain you with any further details of this case, which I have quoted only on account of its etiological importance, and will now invite your attention to another, which in one respect is precisely its converse. I have already told you that when gout and bronchitis are both developed in the same person, it frequently happens that the occurrence of a fit of regular gout relieves the bronchitis, and sometimes, though more rarely, that bronchitis makes its appearance on the subsidence of the gout. T.'s case, which you have just heard, exemplifies the latter and less common mode of alternation. The case I shall now read to you followed, as you will observe, the former and more usual course.

Alfred B., aged 49, painter, became an out-patient under my care Nov. 3d, 1865. He was a tall, stout man, with a broad capacious chest. His family history showed a strong tendency to bronchial affections, and also a gouty taint; his father, mother, and brother having died, he said, of asthma, which evidently meant chronic bronchitis and its consequences; whilst two living brothers suffered from the same disease, and another from gout. He himself had frequently had gout, most commonly in the knees, but also in the toes, wrists, and elbows. Said he was a moderate man, drinking only beer to the amount of two or three pints a day. Had been subject to chronic cough in winter for seven or eight years, and was very liable to take cold even in summer, but did not attribute his ailments to any special exposure.

On admission he was suffering from dyspnœa and cough, attended by a scanty, thick, white expectoration. His face was puffy, tongue fairly clean, pulse 90. The chest rose evenly in respiration, and was equally and normally resonant on percussion on the two sides. The respiration was slightly laborious. The breath-sounds were normal over the upper and anterior part of both lungs, but mucous crepitation was audible in the lowest part of the right lung. Posteriorly, the percussion-resonance was perfectly normal over the base of both lungs; but cooing rhonchus, intermixed with moist crepitation, was heard from the base upwards as high as the angle of the scapula on both sides. The heart-sounds were normal in character and position. The urine was high-coloured, acid, and contained no albumen. I prescribed the compound squill draught of our hospital Pharmacopœia, with twenty minims of tincture of henbane, to be taken every six hours; and a pill for night, containing one grain each of blue pill and ipecacuanha powder, with three grains of powdered rhubarb.

At the end of a week he was very much better, and the report in the Case-book on Nov. 14th is that the cough was much diminished and the expectoration had become more scanty. The chest was everywhere normally resonant on percussion; and the breath-sounds were normal, with the exception of slight sibilus and scanty mucous clicking in the base of both lungs. But at this time gouty symptoms were making their appearance, and in a few days a regular fit of gout came on, during which the cough entirely disappeared.

This is, in brief, the history of a mild case of gouty bronchitis, in which the bronchial affection was evidently relieved by the occurrence of the gouty paroxysm. The case was comparatively so slight a one, and the patient when he first came under my care was so entirely free from any gouty symptoms, that I did not then deem it necessary to resort to any specific treatment for the constitutional taint. I have therefore read it to you, not with reference to that branch of the subject, but merely as another illustration of the intimate relation between gout and chronic bronchitis, shown in this case not only by the alternation of the two diseases in the individual patient, but also by the appearance of one or other of them in so many other members of the same family.

I will now give you the history of another case, still under observation, which I have had the opportunity of watching at intervals during a long period.

George S——, aged fifty-nine, married, a hat-maker by trade, first became an out-patient under my care on the 23d of October, 1863. He then stated that he had for many years been subject to cough and expectoration with dyspnœa, in summer as well as in winter, as much in hot as in cold weather. A medium temperature suited him best, extremes in either direction always increasing his ailments. Had had regular gout twenty years ago, and said that he was in the habit of suffering from time to time with gouty pains in hands and feet, but was free from them at the time of his admission. Was subject also to occasional psoriasis. Allowed that he was a beer drinker, though, he said, only in moderation; but many years' observation has led me to the conclusion, in common with the late Dr. Todd, that to no circumstance is the prevalence of gout among our London artizans more attributable than to the large habitual consumption of malt liquor by this class of persons. The patient himself referred his complaints to exposure to vicissitudes of temperature during his work; but the appearance of the gout having in his case preceded that of the bronchial affection, and the attacks of bronchitis having been accompanied or followed by gout on three out of the four occasions on which I have seen him, we may reasonably assume that the alternations of heat and cold to which he was exposed, had been, at most, only the immediate exciting causes of irritation in a bronchial membrane already predisposed to disease by existing constitutional ailments.

When admitted, G. S. was suffering from a pretty severe attack of bronchitis, attended by much dyspnœa, and by a copious frothy expectoration: but he said that this latter, although he was never altogether free from it, any more than from cough, consisted only, during the intervals between the more acute attacks, of a small quantity of thick, transparent, bluish mucus. Now this is the exact counterpart of what we meet with every day in bronchitic patients, more particularly in those who have also a gouty constitution. They habitually raise in the early morning, and it may be also at rare intervals during the day, little pellets of tenacious, bluish, starch like mucus, sometimes studded with darker specks. This ailment, which may perhaps be almost too slight to attract the patient's attention, is quite compatible with good health in all other respects, but is nevertheless proof of an abnormal condition of the bronchial membrane. In the healthy state, only just as much fluid is secreted by the bronchial membrane as is necessary to keep it soft and moist enough for the due performance of the function of respiration. We may therefore safely assume, as a rule, that wherever there is bronchial expectoration, however small in quantity, the membrane is not in a perfectly healthy state, and is consequently far more liable than a membrane in the normal condition to suffer from immediate exciting causes of bronchitis of whatever kind.

To return, however, to G. S. I should tell you that he was treated successively with our compound senega draught, and with nitro-muriatic acid in combination with tincture of gentian, ipecacuanha wine, and tincture of henbane. On the 11th of December the Case-book reports him as in all respects greatly improved; and he was discharged comparatively well on the 16th of January, 1864. But he was readmitted on the 6th of May of the same year, suffering from gout in the fingers of the right hand, and also from cough, attended by the white, frothy, mucous expectoration characteristic of recent bronchitis. There was now, also, slight œdema in the ankles; but the urine was free from albumen. The chest was found on examination to be normally resonant on percussion; sibilus and rhonchus were more or less audible throughout both lungs; the expiration sound was prolonged, especially in the upper lobes; and mucous crepitation was heard in the base of the right lung. Taking into consideration the mixed character of the illness—showing the actual co-existence of gout and bronchitis—I prescribed a combination of medicines calculated to meet both aspects of the case; that is to say, I gave him four grains each of iodide of potassium and sesquicarbonate of ammonia, ten minims of wine of colchicum, and twenty minims each of tincture of squills and tincture of hyoscyamus in an ounce and a half of camphor mixture, three times a day, together with five grains of the compound

conium pill every night. This is a plan of treatment which, modified according to circumstances, I have often found very serviceable in similar cases, and under its use G. S. gradually improved; but at the end of a fortnight, his appearance being anæmic, a grain of sulphate of iron was substituted for the ammonia in the draught. The gout soon disappeared; but the mucous crepitation in the base of the lung still continuing without change, I ordered a draught containing twenty minims each of tincture of sesquichloride of iron and tincture of hyoscyamus, with ten minims each of ipecacuanha wine and diluted hydrochloric acid in peppermint water, to be taken three times a-day. My patient now recovered rapidly; but continued under occasional observation till the month of August.

He did not present himself again until the 5th of May, 1865, when, curiously enough, at the exact interval of one year from the date of his previous admission, he was readmitted under my care in an almost identical condition. The finger-joints were again swollen and painful, and he was suffering in the same manner from cough and dyspnœa. The bronchitis, however, was in a more advanced and chronic state, the expectoration being now thick, opaque, and muco-purulent, instead of glairy and frothy as on his previous admission. He was treated in a similar manner, but improved more slowly than the year before. The cough varied from time to time; but, though better on the whole, was by no means well, when, towards the end of June, with the accession of hot weather, he was attacked by gout in a more pronounced and regular form, affecting successively the balls of both great toes, the ankles, and fingers, and being uniformly worst on the right side. On the appearance of gout in this acute form the cough and expectoration at once abated; and I then ordered him a draught containing one grain of sulphate of iron, five grains of iodide of potassium, fifteen minims of wine of colchicum, and one drachm of glycerine in peppermint water, three times a-day; with a pill at night consisting of two grains of acetic extract of colchicum and three of Dover's powder. He continued this treatment, with some modification, for a month, and was discharged quite well on the 4th of August.

The relief, however, on this occasion, was not of a long duration, for on the 5th of December he applied for readmission, and still, after two months, continues under treatment. His cough had returned with much wheezing and dyspnœa, and with the frothy, transparent expectoration I have described as characteristic of recent bronchitis. His skin was cool, pulse 90, but quite regular. The sides of the chest rose evenly in respiration, and were equally and normally resonant on percussion. The heart-sounds were normal. The respiration was somewhat harsh below the right clavicle; feeble generally over the front of both lungs. Rhonchus and sibilus were audible over the lower lobes of both lungs posteriorly, intermixed with faint mucous crepitation in the base of the left lung. The urine was normal. At this time he was quite free from gouty pains, and I ordered him our compound squill draught, with twenty minims of tincture of henbane, every six hours; but, bearing in mind his gouty tendencies, I added the night-pill of colchicum and Dover's powder which he had taken before. He has improved greatly as regards the cough, and the expectoration has much diminished, and has become opaque and of a bluish colour, but the subsidence of the bronchial affection has again been simultaneous with the development of gouty symptoms in the joints, though of a less decided character than on the last occasion, this difference being probably due to the specific treatment the patient had been undergoing before their appearance. In addition to the night-pill he is now again taking the iodide of potassium, with ammonia and colchicum wine.

You will observe that in this case the interval between the last attack and the present one was shorter than that between the last attack and the previous one. This is very apt to occur in gouty affections, the attacks of which usually tend to become both more frequent and more obstinate on each successive recurrence. It is, indeed, supposed by some physicians that the use of colchicum as a remedy for gout, although it mitigates and shortens the existing paroxysm, indirectly favours the increasing frequency and severity

of the attacks; and by these authorities the shorter interval between the latter attacks in G. S.'s case would probably be set down to the employment of that drug, which, as you will remember, was administered to him. In this view, however, I by no means concur. I have found colchicum a most valuable remedy in the treatment of gout, provided that it be used in moderation, and persisted in for a sufficient length of time; and provided also that the diet and habits of the patient be properly regulated, not only during the actual attacks of gout, but also during the intervals of comparative health. It is, however, peculiarly difficult to regulate the habits of hospital out-patients, and I strongly incline to believe that this man, although he strictly followed the directions as to medicine, generally disregarded my injunctions as to diet and abstinence from malt liquor. Moreover, he continued to work at his occupation as long as possible before laying up, and resumed work again as soon as possible after an attack of illness, and therefore was never for more than a short time exempt from the exposure to vicissitudes of temperature which no doubt tended, more or less, to excite the frequent exacerbations of his bronchitic symptoms, although not, in my opinion, the original or even the principal cause of them.

[The fact of the frequent occurrence of psoriasis and eczema in cases of chronic bronchitis forms a visible link between the latter disease and gout, in which also the occurrence of psoriasis and eczema is common.]

That these eruptive diseases are, at least for the most part, of constitutional and not of local origin, has been recognized by some of the best observers and highest authorities in the profession. Sir Thomas Watson, in his classical work on the "Principles and Practice of Medicine," when speaking of lepra and psoriasis as closely allied diseases, says, with respect to the former, that it is a blood disease depending upon some poison introduced from without, or more probably bred within, the body; and, with respect to both these forms of cutaneous disease, that he believes they sometimes depend upon the presence or the generation of an excess of acid in the system. This exactly accords with the opinion I have expressed concerning the frequent relation of psoriasis and eczema with a gouty constitution; for gout is undoubtedly a blood disease, dependent upon the presence of uric acid, a poison bred within the body. Moreover, the existence of this relation has been pointed out, in more or less positive terms, by Sir Henry Holland, Dr. Garrod, and others. Sir Henry Holland says, in his eminently suggestive work, "Medical Notes and Reflections," that he has "so often seen psoriasis prevailing in gouty families—sometimes alternating with acute attacks of that disease, sometimes suspended by them, sometimes seeming to prevent them in individuals thus disposed,—that it is difficult not to assign the same morbid cause to these results;" and Dr. Garrod mentions, in his book on Gout, that several instances of skin disease in connexion with gout have come under his observation, and amongst them cases of chronic eczema and psoriasis, which have either alternated with, or accompanied, regular articular gout. He also relates the case of a gentleman who, a few months after the disappearance of gout, was attacked by an eruption of eczema which resisted arsenical treatment, but yielded readily to remedies adapted to the cure of gouty inflammation.

The relation, therefore, as you will have already inferred, which I believe to subsist between bronchitis, the subject of our present consideration, and psoriasis or eczema is that, when the bronchial and cutaneous affections exist in the same individual, they are due to one and the same constitutional cause, and that this cause is most frequently a gouty condition of the system. Further you will easily understand that I have brought this relation so prominently forward, not merely because bronchitis was associated with psoriasis or eczema in a considerable number of my patients, but also because I believe that the presence of either of these diseases, in a person suffering from chronic bronchitis, affords strong presumptive evidence, in the absence of any syphilitic taint, of the existence of a gouty dyscrasia giving rise to both ailments, and may therefore often serve as an auxiliary guide to the diagnosis and treatment of the case. The alternative to which I have just

alluded—that is to say, the occasional syphilitic origin of psoriasis in bronchitic patients, and indeed in such cases of the bronchitis also—is, as a rule, easily ascertained, and I believe it to be much rarer than the gouty origin of these diseases, on which it is my present object to fix your attention. The case of a private patient now under my care affords a better example than any of the cases included in my analysis of the occurrence of constitutional psoriasis together with chronic bronchitis in a person of gouty family, but who had never himself suffered from gout; and I may therefore describe it in a few words.

A gentleman, aged 42, consulted me first a few weeks ago, having suffered for ten years from dyspnœa and tightness of chest, and also from habitual morning cough attended by the expectoration of small masses of thick transparent mucous. These complaints had been gradually increasing from year to year, until latterly he had been more or less laid up with definite attacks of bronchitis every winter. He was always worst in cold, frosty weather; a damp, foggy atmosphere, provided it were mild, not appearing to affect him injuriously. On examination of his chest I found the physical signs of both emphysema and chronic bronchitis, and I found, also, that he was covered on the chest, shoulders, and back, with psoriasis, from which he had not been entirely free at any time during the last five years. He had never himself suffered from either gout or rheumatism, but I ascertained on inquiry that two of his brothers were subject to gout in the regular form.

Another ailment, frequently owing to a gouty state of the system, is sometimes found, like psoriasis, associated with bronchitis, in persons who have not themselves suffered from gout; and although no examples of it occur among the cases analysed, the fact appears to me to bear so strongly on the question of a gouty origin of chronic bronchitis in many cases in which there have been no actual symptoms of gout, that I shall give you a brief abstract of two cases from my private practice in which gravel—the ailment I speak of—alternated with bronchitis, and in one of the two with psoriasis also, in much the same way as the psoriasis alternated with bronchitis and gout in the case which has just been under consideration.

About a year ago I was consulted for a youth, aged 19, who complained of severe pain in the region of the kidneys. His tongue was clean, appetite good, bowels regular; in fact, he looked and felt in perfect health, with the exception of the pain in the back. On examining the urine, however, I found that it contained a large amount of sandy deposit, which fell to the bottom of the chamber utensil immediately on micturation, and did not render the urine turbid like the deposits which are thrown down in the process of cooling. Under the microscope this sand was seen to consist of minute angular crystals of uric acid, which I have already told you is the blood-poison present in gout. Under the use of alkaline and other appropriate treatment, including a strict regimen, the urine ceased to contain any gravel, and the patient entirely lost the pain in the back; but, after a short period of comfortable health, he returned to me suffering from a mild attack of psoriasis. This also yielded in a few weeks to treatment with arsenical solution, in combination with a large excess of potash; but was in turn soon followed by a tedious attack of bronchitis, immediately referable, it is true, to some casual exposure, but the predisposition to which, in my opinion, lay in the constitutional condition which had in the first place caused the gravel, and in the second the psoriasis. I was further confirmed in this opinion by the fact that, when I last saw the patient, at an interval after the attack of bronchitis, the gravel had reappeared in the urine, though in smaller quantity.

The other of the two cases to which I alluded was that of a gentleman aged 60, who came under my care in April, 1864, for a severe attack of subacute bronchitis, to which complaint he had long been subject in the chronic form. He had not been entirely free from cough for several years, and constantly suffered much from dyspnœa. There was a considerable degree of emphysema, and, as might be expected in such circumstances, the illness was a tedious one. When, however, at length, the bronchial irrita-

tion abated, he began to pass large quantities of uric-acid gravel. He would give me at each visit four or five parcels of this gravel, put up like powders, containing from ten to twenty grains each. After a time he appeared to be cured of this ailment also, and he got into comparatively tolerable health, almost entirely lost his cough, and was considerably relieved from the dyspnœa. He went abroad, and I did not see him again till last summer, when he called on me, complaining of symptoms which pointed to the probability of a stone having formed in the bladder, and this indeed proved to be really the case. Meantime his bronchitic symptoms had remained permanently much less than for years before.

You will by this time fully understand that the true relation which I believe to exist between the chronic bronchitis and the gout, psoriasis, albuminuria, and gravel, in all these different cases which I have included under the head of gouty bronchitis, is, that they all depend upon a common humoral dyscrasia, which in one case produces gout, in another gravel, in a third psoriasis, or, as in the cases which we have been considering, bronchitis co-existing or alternating with one or more of these other ailments. These are all, therefore, examples of one form of what in my last lecture I called secondary bronchitis—that is to say, bronchitis arising out of some internal condition of the system; that internal condition being, as we have seen, in all these cases, the existence of the humoral dyscrasia which is recognized as the cause of gout.

Regarding the treatment of this form of secondary bronchitis, it is clear from the necessarily complicated nature of the subject that I cannot pretend to give you any specific directions apart from the indications you will not have failed to gather from my own treatment of several of the cases discussed. The remedies appropriate to the bronchitis and to the other affections must obviously be varied and modified from time to time, in order to meet the constantly varying conditions of different patients, or of the same patient at different times; and this it is only possible to illustrate by means of examples, which might be infinitely multiplied if time allowed. The one essential point towards the successful treatment of all such cases is, that you should constantly bear in mind the presence of a constitutional cause for the local affection, and not rest satisfied with directing your efforts towards the removal or alleviation of the bronchitis, but endeavour as far as possible to combat the dyscrasia which is the real source of the patient's ailment.—*Lancet, March* 9, *and April* 20, 1867, *pp.* 293, 479.

26.—ON PNEUMONIA.

By Dr. A. T. H. Waters, Physician to the Liverpool Northern Hospital.

[Discrepancy of opinion still exists with reference to some points connected with the morbid anatomy of the disease, such as whether the capillaries of the pulmonary artery or those of the bronchial arteries are the vessels which are involved in the disease; also, which particular part of the pulmonary substance is the seat of the disease.]

To refer briefly to the arrangement of "the ultimate pulmonary substance;" viz., that which constitutes the respiratory portion of the lung. Each terminal bronchial tube has connected with it a number of elongated cavities or "air sacs." These are separated from each other by thin membranous walls, on which are found a number of cup-like depressions, alveoli, or air-cells. The series of air-sacs connected with the extremity of each bronchial twig, with its system of blood-vessels, &c., constitutes a *lobulette*. Each lobulette is perfect in itself, and has no lateral communication with adjoining lobulettes. A varying number of these lobulettes constitutes a lobule. Each lobule is, in the human lung, surrounded by a strong sheath, which possesses a good deal of elasticity, and is further connected with adjoining lobules by means of a small quantity of areolar tissue. The union of a number of lobules constitutes a lobe.

The pulmonary arteries are the only blood-vessels distributed to the respiratory portion of the lungs; viz., the walls of the air-sacs. These

arteries, as soon as they reach the termination of the bronchial tubes, give off small branches, or arterioles, which take their course along the walls of the air-sacs, and break up into a capillary net-work, which constitutes the so-called pulmonary plexus. As these vessels are the only ones which are found in the walls of the air-sacs, they must be engaged, not simply in carrying blood for the special function of the lungs, but also for the nourishment of the tissue to which they are distributed.

Although the bronchial arteries pass along the bronchial tubes, and supply the structures of those tubes and the areolar tissue of the lungs, they yet send no branches to the walls of air-sacs, which are solely occupied, as I have already stated, by the plexus derived from the pulmonary artery.

In speaking of the areolar tissue of the lungs, I wish it to be distinctly understood that no tissue of this kind is found in the walls of the air-sacs. These walls consist of a semi-transparent membrane, enclosing within it a quantity of elastic tissue together with the capillary plexus.

Areolar tissue is only demonstrable in the human lung, surrounding the bronchial tubes and the larger blood-vessels, and connecting the various lobules with each other. And although, as I have pointed out elsewhere, in the fœtal lung it is possible to separate each individual lobulette from those by which it is surrounded, no such separation can be made in after life; and my opinion is, that any areolar tissue which may exist at birth around the lobulettes becomes subsequently absorbed. At all events, if any remain, the quantity is so small that it cannot be demonstrated.

Such being the distribution of the blood-vessels of the lungs, and the arrangement of the areolar tissue, the next point for consideration is, the exact seat of the pneumonic inflammation.

On examining, under the dissecting microscope, a piece of inflamed lung which has reached the stage of hepatisation, it is at once seen that the seat of exudation is the air-sacs. These cavities are filled with solid matter; and, if the preparation have been kept in spirit for some time, moulds of the cavities can be drawn out. As the air-sacs are the seat of the exudation, it is obvious that the latter must be poured out from their walls. The structures composing these walls must, therefore, be the seat of the inflammatory process; and, as they contain no other vessels than those derived from the pulmonary artery, it is the branches of that vessel alone which are involved in the disease.

In a piece of hepatised lung, exudation is sometimes found in the smallest bronchial tubes; at other times it is absent from them, and merely fills the air-sacs. The presence of this exudation in the bronchial tubes by no means proves that it has been poured out from their lining membrane; for it may have passed into the tubes from the air-sacs, in consequence of the over-distension of the latter.

In some cases of pneumonic inflammation, there is no reddening of the mucous membrane of the finest bronchial tubes—no *post-mortem* appearances to show that there has been anything more than a simple uncomplicated inflammation of the air-sacs; whilst in other cases an increased vascularity of the bronchial membrane indicates the concurrent existence of bronchitic inflammation.

Some pathologists, in speaking of the morbid anatomy of pneumonia, have described the exudation as taking place in part into the "interstitial tissue." They have not, however, accurately described what they mean by "interstitial tissue;" and it is very important, in connexion with this disease, that clear notions should exist in reference to this particular point. I have already mentioned that the lungs are not permeated throughout by areolar tissue; and that it only exists in certain parts, and in small quantities. The true lung-tissue—that which has been known as the parenchyma of the lung—consists of the walls of the air-sacs. These walls are firm and strong, but very thin. They consist of yellow elastic tissue, and a basement membrane inclosing the pulmonary plexus. No areolar tissue is found in these walls—a fact which a careful examination of the morbid appearances produced by pulmonary ephysema fully demonstrates; for in that affection the perforation

of the lung-tissue, which takes place, produces a lateral communication between the air-sacs, but no extravasation of air into their walls.

Although, in pneumonia, the walls of the air-sacs swell and become somewhat thickened, chiefly in consequence, I believe, of the enlargement of the capillaries which they contain—partly, probably, from the retaining of some of the serous fluid which exudes from those vessels—they are yet not the seat of anything like extensive exudation. Their structure is, in fact, such as not to admit of it.

It is the opinion of at least one pathologist—Grisolle—that in pneumonia the capillaries are very probably augmented in number, as well as in size. It is impossible to speak positively with reference to this point; but my own opinion is decidedly opposed to that of Grisolle. The arrangement of the pulmonary plexus in health is such, and its branches are so numerous, so closely set, and anastomose so freely with each other, that I believe no further development of vessels ever takes place.

In the stage of grey hepatisation, the air-sacs are still the seat of the exudation; and no destruction of their walls takes place unless abscesses are formed. There is no intestinal suppuration. The exudation-matters, with which are mixed, but apparently not always, pus-corpuscles, and a considerable quantity of fat, are contained within the air-sacs, and, in the process of recovery, are either absorbed or expectorated.

From a consideration of the foregoing facts, I think it may be concluded that pure pneumonia consists of an inflammation of the walls of the air-sacs; that the blood-vessels involved in the disease are the branches of the pulmonary artery which constitute the pulmonary plexus; and that the capillaries of the bronchial arteries are in nowise implicated, unless there is a concurrent bronchitis, which is an addition to, and not an essential part of, pneumonia.

If the opinions I have expressed with reference to the seat of pneumonia be correct, they tend to simplify our views of the nature of the disease. The affection becomes localised in the pulmonary plexus—a circumstance which gives it a greater importance than it would possess, did it depend simply upon a morbid state of the bronchial arteries, which are still held by some to be the nutrient vessels of the air-sacs, and, as such, the sole vessels implicated in pneumonia.

There are some circumstances which seem to me, apart from the anatomical considerations I have referred to, to bear strongly in favour of the views I have expressed. Amongst these, I would mention the severity of the fever which accompanies pneumonia, assimilating it, in this respect, very much to a blood-disease; and, again, the rapidity with which consolidation of the lung takes place. It is easy to account for this rapid consolidation, supposing the materials to be poured out from the great pulmonary plexus; but it is very difficult to understand how the small bronchial arteries could thus rapidly give rise to the effusion of so large a quantity of material, supposing them to be solely concerned in its production.

It has been objected to the view that pneumonic exudation takes place solely into the air-sacs, that, in certain forms of the disease, there is no expectoration: further, that *post-mortem* examination shows that, in such cases, exudation has taken place into the "interlobular tissue." I have already explained my views with reference to the non-existence of any tissue around the air-sacs which could be the seat of exudation; and that, in the many cases of pneumonic lung which I have examined, I have always found that the effused matters have been poured into the air-sacs.

With regard to the absence of expectoration in certain cases of pneumonia, and the inference that has been drawn from the circumstance that the exudation is not poured into the air-sacs, I cannot think that the fact affords any such proof. Expectoration in pneumonia is a symptom which varies so much, it is so often small in quantity when the inflammation is extensive, and *vice versâ*, that it bears no proportion to the amount of lung involved; nor can its entire absence throughout a case be admitted as proof that the exuded matters have not been poured into their usual seat. *Post-mortem* examination alone can afford proof of this; and, as I have before remarked, I have never

found, in the many specimens I have examined, the exudation occupying any other site than that I have referred to. That the areolar tissue which surrounds the lobules of the lung *may* be the seat of inflammation, I do not deny; but I have never verified the existence of such a condition by *post-mortem* examination; and, if it do exist, it must constitute a disease very different from ordinary pneumonia.

That the seat of pneumonia is the air-sacs of the lung, and that the exudation in it is poured into their cavities, is no new doctrine; but, as I have already remarked, the view is one by no means universally acknowledged. There can be no doubt that Dr. Addison clearly defined the seat of the pneumonic exudation, and expressed an opinion that no intervesicular areolar tissue existed in the lung. But the views of Addison were not generally admitted by pathologists, as is abundantly evident in their writings. My researches on this subject were commenced in the year 1857, and my conclusions were arrived at without any knowledge of the views which had been so clearly expressed by Addison. A careful investigation of the healthy lung-tissue soon convinced me that no intervesicular or interstitial tissue existed; and subsequent examination of morbid specimens showed me that the air-sacs were the seat of true pneumonic exudation.

Before I proceed to speak of the treatment of pneumonia, I wish to say a few words in reference to the early physical signs of the disease, and the morbid conditions by which they are produced.

The general symptoms and signs which characterise the onset and progress of pneumonia are so well described in your various systematic works, and will be so frequently illustrated in the cases which I shall have to detail, that I shall purposely abstain from any regular description of them here. I must, however, refer at some length to a phenomenon which I have noticed, and about the existence of which there is some difference of opinion.

I am of opinion that engorgement is not the earliest morbid condition of pneumonia; and I also believe that crepitation is not the earliest physical sign of the disease. Crepitation is the auscultatory sign which characterises the stage of engorgement, and practically is the first sign on which you can depend as indicating the existence of pneumonia. I shall have to speak of it again, and point out to you that it may be heard when no pneumonia is present.

But, of the earliest morbid condition: I agree with the conclusions arrived at by Dr. Stokes, that there is a stage prior to that of engorgement, characterised by dryness, intense arterial injection, and, consequently, a bright vermilion colour, of the pulmonary membrane. In proof of the probability of this condition, I must appeal to the facts furnished by auscultation; viz., the existence of a harsh, loud, puerile, respiratory murmur, preceding the crepitating *râle*.

It is very rarely that an opportunity is afforded us of making an examination of the chest in incipient pneumonia; and to this fact, we must, I think, attribute the differences of opinion which have been expressed as to the earliest physical signs of the disease.

I have had two cases under my care in this hospital, in which I noted the existence of a loud, harsh respiratory murmur as an initial physical sign of pneumonia. In both cases, there was acute primary pneumonia occurring in lungs previously healthy. I think it important to note this; for, to render the observation of this phenomenon perfectly trustworthy, it ought to be made on a case, not where there is progressive inflammation, nor yet where there are consecutive attacks of inflammation. for the cause of the phenomenon might, under such circumstances, admit of some doubt; but where, the lung being in a healthy condition, inflammation of the organ comes on suddenly. Let me refer you to the following cases:

Case 1.—P. F., a carter, was admitted into the hospital under my care, on August 8th, 1864. On the day of admission, at an early hour, he was out in a shower of rain, got very wet, and did not change his clothes. In the course of two or three hours, he felt pains about the limbs, and had severe rigors.

When admitted into the hospital about mid-day, he was seen by the house-

surgeon. He then complained of pain in the lower part of the left side. There were no febrile symptoms, and no abnormal physical signs about the chest.

On the following day, about noon, his condition was as follows:—The pulse 120, and full; respirations 32; skin very hot and dry; tongue coated with a white fur. The pain in the left side had increased. There was no cough, but much dyspnœa. The percussion-sound and movement of the left side of the chest were natural. *At the lower and back part of the left lung, a loud, harsh, peculiar, respiratory murmur was audible.* No such sound could be heard elsewhere. The patient was ordered a grain of opium three times a-day, with small doses of tartar emetic.

The next day the pain in the side was almost gone. The pulse was 104; the respirations were 28. The physical signs were as follows:—Deficient movement of the left side, dulness at the left base, with crepitating *râle* over the lower half of the left lung. The crepitating *râle*, which was distinctly of a pneumonic character, occupied, in fact, this day, the seat of the harsh loud respiration of the preceding day.

It is needless to follow the history of the case further. The crepitation was succeeded by bronchial breathing and all the symptoms of confirmed pneumonia. The patient made a satisfactory recovery, and was convalescent on the eighth day of the attack.

Case 2.—D. M., a Frenchman, was admitted into the hospital, under my care, on January 23rd, 1865. Two days before admission he was perfectly well. He complained of dyspnœa and pain in the chest. On examination, *a loud, harsh, respiratory murmur* was heard over the lower and back part of the left lung. The movements of the side were good, and there was no dulness. The breath-sounds over the opposite lung were normal. On the following day the physical signs were as follows:—Slight dulness at the base of the left lung, and well-marked crepitation over about the lower half of the same lung. In fact, as in the preceding case, the loud respiration of one day was replaced by the crepitating *râle* on the next. The patient subsequently had all the symptoms of confirmed pneumonia—dulness, bronchial breathing, and rust-coloured sputa. He was convalescent about the tenth day.

From the observation of these cases, I cannot entertain the slightest doubt that neither is the crepitating *râle* the earliest physical sign of pneumonia, nor engorgement its first morbid condition. It is true that I have never been able to demonstrate, by a *post-mortem* examination, the dryness of a pulmonary membrane and the arterial injection, which I believe to exist prior to the stage of engorgement; nor, indeed, would it, I think, be easy to satisfy the minds of those who are sceptical on the subject by any such examination; for they might consider the appearances the result of mere congestion. At the same time, this absence of *post-mortem* proof must not blind us to the facts which clinical experience teaches us.

As I have already mentioned, there is much difference of opinion as to the existence of this phenomenon; but before I speak of the objections which have been brought forward against the possibility of its occurrence, I wish to explain the way in which, I believe, this harsh respiration is produced, and to point out to you the condition in which I suppose the pulmonary membrane to be; and I shall take this opportunity of explaining to you what I consider to be—1. The cause of the ordinary respiratory murmur; and, 2. The cause of the crepitating *râle*.

First, as to the respiratory murmur:—Various causes have been, from time to time, assigned for its production; and, although, in a practical point of view, its exact seat and proximate cause may appear unimportant, provided we are familiar with the sound itself, and can rightly interpret the modifications of it which result from disease, yet it must be confessed that clear views of the physical phenomena of all healthy organic actions are very desirable; and just as our knowledge of the simple manner in which the sounds of the heart are produced has facilitated our diagnosis of cardiac diseases, so more precise information than we already possess, with regard to other point of a similar nature, cannot fail to be followed by beneficial results.

To the physical condition of the lung it is obvious that we must look for an explanation of the cause of the respiratory murmur; and there is one anatomical point, either unknown to those who have given their attention to this subject, or overlooked by them, which appears to me to offer a satisfactory solution of the phenomenon.

Without attempting to examine critically the opinions of others, I must content myself with observing that I believe the air-sacs of the lungs to be the seat of the murmur; and I shall now proceed to point out the arrangement which exists at the mouth of each air-sac, to which arrangement I am of opinion that the sound is due.

I have pointed out elsewhere the manner in which each bronchial tube terminates in a series of air-sacs; and the passage which has the most important bearing on the question of the cause of the respiratory murmur is the following:—

"The air-sacs consist of somewhat elongated cavities, which communicate with a bronchial ramification by a circular opening, which is usually smaller than the cavity to which it leads, and has sometimes the appearance of a circular hole in a diaphragm, or as if it had been punched out of a membrane which had closed the entrance to the sac."

This arrangement is best seen in the lungs of children and of adults. In old age it has frequently disappeared, more or less. It may be often well seen in a piece of lung, the blood-vessels of which have been injected with coloured size, and which, after being dried, has been subsequently soaked in spirit. By careful dissection under a microscope the membrane, guarding the mouth of the sac, and narrowing the entrance to the cavity, is easily demonstrated. The membrane forms a part of the aërating walls of the air-sac, and has branches of the pulmonary artery ramifying in it.

It is obvious that a condition of this kind must have an influence on the passage of the air into the air-sac; that, to a certain extent, it must produce an impediment to the current of air, and thus give rise to a sound.

As the air is moved along the bronchial tubes it meets with no obstruction to its passage; but at the commencement of the air-sacs an opening exists which is smaller than the cavities between which it is placed. As the air-sacs expand with each inspiration, air must pass through the constricted opening. I believe that, in the passage of the air through this opening, the main element of the respiratory murmur consists.

The following facts appear to me to afford arguments in favour of the view I have advanced: the respiratory murmur is loud and well marked in infancy and childhood; it becomes modified in adult age, and in old age it is frequently very feeble. In the infant the membrane placed at the mouth of the air-sac is well marked and uninjured; the opening in it has a clearly defined and sharp margin; and, moreover, it is smaller—not only absolutely, but I believe also relatively—than in after life. In the adult, the air-sacs have undergone enlargement, and the membrane at their entrance is more or less perfect according as the lung is in a more or less healthy state; whilst, in old age, the membrane has often, to a great extent, disappeared, apparently as the result of the wasting and absorption which so frequently occur in the lungs of those advanced in life.

Further, the changes which take place in the character of the respiratory murmur in emphysema of the lungs afford an additional argument in support of this view. In this disease, in consequence of distension, rupture, and absorption, the air-sacs become much altered in character, and the membrane guarding the entrance to them entirely disappears as the disease progresses. The obstacle to the passage of air is therefore removed; and hence one reason of the extremely feeble respiratory murmur which characterises the affection.

And now let me explain to you the way in which, I believe, this healthy respiratory murmur passes, first of all, into the harsh puerile respiration of incipient pneumonia, and subsequently into the crepitating *râle*, when the disease is fully established. It appears to me that the first phenomenon, which is merely an exaggeration of the healthy sound, is the result of the

dry and swollen condition of the pulmonary membrane; that this gives rise to a constriction of the mouths of the air-sacs, and approximates them, therefore, to the condition which they present in childhood, when a loud respiratory murmur is usually heard. I see no reason to doubt that there is a dry stage in pneumonia, as well as in inflammation of mucous membranes. It is said that every stage of inflammation of serous membranes is marked by exudation; and it has, therefore, been inferred that such must be the case in pneumonia. But, although the lining membrane of the air-sacs resembles to a certain extent a serous membrane, yet it does not possess all the characters of such membrane. It consists, as I have already mentioned, of some yellow elastic fibres, a very delicate basement membrane covering the blood-vessels, and a layer of epithelium having somewhat the character of the epithelial cells found on serous membranes, but being by no means identical with them.

It has been objected to the view that there is a puerile respiration preceding the crepitating *râle* in pneumonia, that the sound which is thus described is nothing more than the result of a supplementary movement in parts around a spreading obstruction; that when this sound is heard, and afterwards is followed by crepitation, there has been, at the time when it was heard, consolidation of the lung in adjacent, more deeply seated, portions. I think that the circumstances under which the sound was heard in both my cases negative the possibility of such an explanation of it. Take the first case. The patient is admitted at noon on the 18th August, having got wet early in the morning, previously being in good health. He is carefully examined, and nothing abnormal is found about the chest; nor is there any fever present. It will scarcely be inferred that pneumonia was present at that time. Twenty-four hours afterwards, he is again examined. There is a good deal of fever present; the respiration is hurried; and there is pain in the chest. There is no dulness; but a harsh respiration is heard over the back of the left lung. Now, is it at all probable that, during the short period that had elapsed since the man's attack, consolidation of the lung could have occurred —especially taking into consideration the subsequent progress of the case? For, after the lapse of twenty-four hours more, we have the stage of engorgement established in the more superficial portions of the lung, but no consolidation, I need not refer to the second case, for it presents features similar to those of the first.

I feel convinced that, in the two cases which I have detailed to you, this harsh respiration was an initial symptom of pneumonia; and although it may not be a constant precursor of the crepitating *râle*, I believe it would be much more frequently met with, if we had more opportunities of auscultating our pneumonic patients in the early stages of their disease.

But now, as to the manner in which the crepitating *râle* is produced: I believe that its seat is in the air-sacs, and that it is caused by their expansion at the time when their walls are covered with the secretion which is poured out upon them. The expansion of the sacs at the time when they are partially filled with fluid appears to me to afford the conditions necessary for the production of the *râle*. That it has its seat in the finest bronchial tubes, I cannot admit; for in some cases these tubes are found after death free from exudation.

There are conditions under which the crepitating *râle* may be heard when no pneumonia is present. In certain cases of œdema of the lung, I have heard a crepitation as pure as anything I have ever heard in the most typical pneumonia; and trusting, therefore, to this sign alone, you might in some cases be misled as to the nature of the disease; but, generally speaking, there is no difficulty. The ordinary symptoms of pneumonia are absent in these cases; there are dropsical effusions in various parts of the body, and other conditions which enable you to form a correct diagnosis. Still some cases are very puzzling, and at first are apt to mislead us; such, for instance, was that of Scott, who died in L. Ward, and who, whilst in the hospital for valvular disease of the heart and dropsy, was seized with pneumonia. When I first heard the crepitating *râle* in this man, I thought it was the result of

œdema of the lung; and it was only when other symptoms and signs developed themselves, that I became sure of the existence of pneumonia.

You may perhaps ask me how it happens that we hear the same sound in œdema of the lung as in pneumonia. The fact is, that the seat of exudation in the two diseases is the same; and in both conditions we have present, in the air-sacs, a certain amount of air and liquid exudation; the only difference being, that in one instance the liquid is somewhat more viscid than in the other.—*British Medical Journal, Jan*, 19, *and March* 23, 1867, *pp.* 48, 311.

27.—ON THE TREATMENT OF THE ADVANCED STAGE OF CROUP.

By Dr. Eben. Watson, M. A., Surgeon to the Glasgow Royal Infirmary.

[The true indication is to relieve the spasm of the glottis, or to reduce the œdema of the mucous folds above it, without wounding the trachea, and then to use measures for the expulsion of the false membrane in due time through the natural openings.]

The topical application of solutions of the nitrate of silver of gradually increasing strength is a powerful reducer of the irritability of the glottis, but it requires far too much time for its action, even if it were otherwise suitable to cases of exudative inflammation, which I believe it is not. Emetics do certainly act on the glottis, and are such great helps in relaxing it that they can never be dispensed with, but their operation is only short-lived, and the patient would soon be exhausted by their very frequent employment. The inhalation of chloroform is perhaps the most speedy and powerful relaxer of the glottis at present known, and it may with caution be used in the cases to which I am now referring. It has this advantage, likewise, that, its action may be maintained for a much longer time than that of those previously mentioned.

A few weeks ago a child of two years old was brought into one of my wards in the Infirmary, in the advanced stage of exudation croup. I thought he was suffering specially from spasm of the glottis, andhad him put under the influence of chloroform, in which state his breathing became much fuller and more satisfactory, while both colour and heat greatly improved. But the mother, terrified at some mention that had been made of an operation, would not consent to his remaining in the house, and in spite of all our remonstrances, took the child home that same day, I suppose to die.

Another good relaxer of the glottis is hot water, with which the vinum belladonnæ may, I think, be usefully mixed, and the best way for applying it is by Siegle's atomizer. In this way the patient is made to inhale the mixture as a spray, and even if he be an infant, the air in his neighbourhood may be so impregnated with the vapour that he cannot escape its action. I have seen much advantage from this appliance both in croup and in other laryngeal states allied to it.

These agents for relaxing the glottis have a double advantage; for they both gain time, which is so precious in these cases, and they may be alternated with other means, such as emetics, for the expulsion of the false membrane. They are the only relaxers of the glottis of which I can at present speak from experience; but I do not doubt that when attention is fairly drawn to the subject, other agents will be discovered still more appropriate to the fulfilment of this important end. At all events, that is the direction in which our endeavours ought to point, if we are ever to be able to overcome this formidable feature of advanced croup.

In those cases of the disease in which suffocation becomes imminent from the supervention of œdema of the aryteno-epiglottidean folds, tracheotomy is often performed, and were it not for the unsound state of the trachea this would be a successful operation. Indeed, it will be found on a careful examination, that the most of those cases which are reported as successful performances of tracheotomy in croup are cases of œdema glottidis, often

without a symptom of exudation at all, or in which the false membrane has been previously expelled, for œdema is apt to occur late in the disease after the patient has struggled through its exudation stage. In such circumstances, the obstruction to respiration being at the glottis, tracheotomy relieves with certainty; but I repeat, that if the operation be performed during the exudative inflammation of the trachea, the natural and ordinary result is aggravation of the morbid action too often to a fatal extent. I also assert, with some confidence, that, in the vast majority of cases, œdema glottidis may be reduced without tracheotomy by the timely employment of what I think more rational and certainly much safer measures.

Thus, for instance, I have in a good many cases of this kind successfully applied a strong solution of nitrate of silver to the œdematous swellings by means of laryngeal sponge-probang, and, whenever this is rightly done, it will be found that there is an almost immediate transudation of serum from the tumour whereby its bulk is diminished and the air permitted to pass more easily through the glottis.

If, however, the swelling does not yield to this application, or not with sufficient rapidity for the urgency of the case, there is another procedure of more speedy efficacy which should then be practised. I refer to pricking or incising the œdematous parts with the laryngeal lancet;—a measure which I can thoroughly recommend in suitable cases. In the performance of this little and almost bloodless operation the laryngoscope is not always available, either owing to the age or irritability of the patient; and, perhaps, in all cases, the best and safest way of performing it is to steady the tumour with the forefinger of the left hand, and then putting in the lancet, with its blade concealed till it touches the part at the tip of the finger, to protrude the blade by means of the spring in the handle and so to prick or incise the part as desired. This is not a difficult operation, and I am certain from my experience of it, that it gives relief to the breathing, both speedily and effectually, without incurring any of the dangers of tracheotomy.

When this operation is required during the exudative stage of croup, I find it useful to follow it with an emetic, by which means all the loosened exudation is expelled and the full amount of benefit ensured. Much has been said and written of the advantages of particular emetic medicines in croup. But I suppose that the essential quality, desirable in such cases, is speedy action with as little as possible of depressing effect: and this is abundantly fulfilled by a combination of ipecacuan powder with sulphate of zinc. In my practice I never prescribe the tartrate of antimony alone as a vomit, especially to a child, but I find that drug useful in cases of croup in almost every stage, when given in small doses, of the wine for instance; I think its effect when thus administered, is chiefly that of soothing and calling forth a natural moisture upon the lining of the wind-pipe. Since, moreover, the antimony is not used in these advanced cases for its depressing effect, it is not inconsistent to employ it as I have described, while at the same time it may be necessary to support the patient's strength with soups or even with wine. The inhalation of a spray of warm water from Siegle's atomizer is often of essential service after lancing the œdematous aryteno-epiglottidean folds. The vapour just acts as a fomentation does to external parts, by soothing its irritability and reducing congestion.

In conclusion, I think I may now re-state in brief terms the practical result which, in my opinion, flow from the preceding consideration of this subject.

1. Tracheotomy should on no account be performed during the exudative stage of croup; for it is either useless in the worst cases or positively hurtful in those where there is any hope of recovery.

2. In those cases of advanced croup in which the spasmodically constricted glottis is the cause of immediate danger, our efforts should be directed towards its relaxation, for which purpose no very satisfactory means are as yet known to us, but perhaps the best are the inhalation of chloroform and the use of Siegle's atomizer, interrupted occasionally by the employment of an emetic.

3. In those cases in which œdema of the aryteno-epiglottidean folds is the

proximate cause of impending apnœa, the swellings should be reduced by the topical application of strong solutions of nitrate of silver, or by the laryngeal lancet. And, lastly,

4. After the expulsion of the false membrane from the windpipe, the performance of tracheotomy will very seldom be necessary; but, if it is required from obstinate disease of the larynx, it will generally prove successful, in striking contrast to the sad results of the operation when performed while the trachea is lined with exudation.—*Glasgow Medical Journal, Feb.*, 1867, *p.* 374.

28.—ON NERVOUS ASTHMA.

By Bamberger.

(Translated from the Norse by Dr. W. D. Moore, of Dublin.)

[The case which gave rise to the following remarks appeared originally in the Würzburger Med. Zeitschrift, 17 Band, i. and ii., Hefte, 1865, whence they have been translated into the Norwegian Magazine of Medical Science by F. Kiær. Not having access to the above-named German journal, I shall translate the author's remarks from the Norwegian version; the details of the case itself I do not think it necessary to reproduce.—W. D. M.]

Nervous asthma, the existence of which it is in the present day no longer necessary to prove, may be best divided into a central and eccentric or reflex asthma. The first is a very rare form of disease, whether it be based upon material changes, or these cannot be demonstrated; reflex asthma, on the contrary, cannot be considered as so very rare. The abnormal irritation, the conduction of which takes place chiefly, if not exclusively, through the vagus, proceeds in most cases from the respiratory organs, and asthmatic attacks of undoubtedly nervous nature are by no means uncommon in the most different pulmonary affections, especially in emphysema, but also in violent catarrh, pleuritis, tuberculosis, &c. The so-called hay asthma is likewise a reflex asthma, depending upon very extensive bronchitis. In general it is not difficult to distinguish such a nervous attack from the mechanical dyspnœa dependent on the presence of the pulmonary affection. Nervous asthma in an emphysematous patient differs very essentially from the pseudo-asthmatic dyspnœa, which the same patient experiences at another time in acute catarrh, or where there is a large accumulation of mucus. That the irritation may also proceed from other organs, can scarcely be matter of doubt, although on this point we know little positively. That asthmatic attacks may be caused by diseases in the heart and aorta, may be regarded as tolerably certain, although on account of the pulmonary affection almost invariably coexistent therewith, it is difficult to prove that the abnormal irritation proceeds exclusively from those organs. Undoubtedly there exists an hysterical asthma, which ought more correctly to be looked upon as of central origin. On the other hand, the theory which considers asthma as a symptom of gastric, hepatic, splenic, and intestinal affections; that of hemorrhoidal asthma and of asthma in tapeworm, in renal diseases (the so-called asthma urinosum is nothing else than pulmonary œdema), and in those of the sexual organs, would not now, as it did of old, find many adherents, yet we ought to beware of too unconditionally, and without further examination, entirely rejecting the older theories.

The case above recorded is indeed with great probability to be considered as one of reflex asthma, proceeding from the lung. At least it appears from the history of the case that a violent catarrh had preceded the attacks, and this view was confirmed by the *post-mortem* examination. As to the finely vesicular emphysema, we may without any hesitation regard it as a secondary phenomenon, produced by the extremely violent disturbances of respiration, but the state of the case would not in any essential point be altered, were we to look upon the emphysema as pre-existing, for which, however, there is not the slightest reason. The other changes in the body present nothing of special interest. The dilatation of the right side of the heart,

which, moreover took place to a moderate degree, is a result of the emphysema. The moderate thickening of the left ventricle can be brought into casual relation only to the atheromatous process in the arteries, just as the systolic bellows' murmur, observed along the aorta during life, can be explained only by the thickening of the inner coat of that vessel. The firm and hyperæmic state of the spleen and kidneys and moderate degree of hydrocephalus are to be considered only as results of the disturbance of the circulation.

But what in this case especially interests us is less the casual relation, which will long continue as obscure as are most of the neuroses, than the mode in which the asthmatic paroxysm manifested itself, and the physical state upon which this depended.

What, properly speaking, is nervous asthma, and how is it developed? To this question we obtain, with rare unanimity, the answer—Nervous asthma depends upon spasm in the bronchi, and mainly in the finer, contractile fibre-cells. Bergson in particular, in his well-known monograph, has taken the greatest trouble to prove this upon negative and positive grounds, but unfortunately without the slightest success. There is just now no other reason given for this view than the mere presence of those muscular elements, which, indeed, involve the possibility, but by no means consequently the actual existence of such a spasm.

Up to the present, however, only Wintrich has appeared in opposition to this generally received hypothesis, and it may be said that Wintrich's statements contain more sound reason than all hitherto written upon nervous asthma. Wintrich does not indeed deny the possibility of a spasm in the bronchial muscles, but that such can be the cause of nervous asthma, and this for two reasons. In the first place, he observed several cases of the disease, in which the diaphragm during the attack lay very deep and immovable, where manifestly there was only tonic spasm of the diaphragm while this phenomenon cannot possibly occur in bronchial spasm. In the second place, both the inspiratory and expiratory forces are considerably greater than the sum of the forces of the bronchial muscles. I am myself indeed quite of the opinion, that hitherto there is no warrant for the assumption of bronchial spasm as the cause of asthma, and that the causes of the latter must, in the majority of cases, be sought elsewhere; but it, nevertheless, appears to me that it is going too far completely to deny the possibility of such a condition. Against these arguments it may, in fact, be objected, that, in the first place, it is not proved that the diaphragm in all cases of nervous asthma is found to be situated low down and immovable; and in the second place, the preponderance of both the inspiratory and expiratory powers over the powers of the muscular pulmonary elements may indeed be admitted, but this does not hinder us from assuming a conflict between the two, and it is precisely upon this that the asthmatic attack might depend. We might, therefore, simply assert, that in such a conflict the final victory must always remain with the "legitimate" respiratory powers as the stronger, or, in other words, that no one could be suffocated in an attack of purely nervous asthma.

If we now return to our case, there can be no doubt that in it there could have been no such thing as a spasm in the bronchi. Even the deep position of the diaphragm in itself renders such a theory impossible. I will, moreover, hereafter revert to the symptoms which must attend spasm in the bronchi, and it will be seen that most of them are directly opposed to those observed in the case in question.

On the other hand, all the phenomena may, with almost mathematical accuracy, be accounted for by the existence of a tonic spasm in the diaphragm and secondary antagonistic spasms in the expiratory muscles depending thereon. The low position and immobility of the diaphragm, in spite of the enormous efforts of its antagonists, in connexion with the unyielding nature of the lower half of the thorax, is, in this case, the decisive and convincing element. The absence of respiratory murmur in the lower part of the chest is easily explained by the absolute immobility of the parts of the lungs lying

above the diaphragm. Inspiration could take place in the upper parts only with the aid of the superior, and especially of the cervical respiratory, muscles. The inspiratory increase of the capacity of the chest on a level with the xiphoid cartilage, in spite of the complete immobility of the diaphragm, is essentially to be considered only as a diminution of the contraction of the thorax effected during the expiratory spasm by the abdominal muscles. But one phenomenon is more difficult of explanation—namely, the distinctly tympanitic sound in the lower part of the thorax during the expiratory spasm. When the attack occurred, and the diaphragm suddenly assumed its low position, the inferior portions of the lung must have been suddenly inflated. During the expiratory spasm the abdominal muscles must strongly compress the thorax, and thus the pulmonary cells and their membranes must come to be under a very strong pressure. But how is the tympanic sound to be thus explained? According to Skoda's theory this circumstance—namely, great tension of the cell membranes, would produce exactly the opposite effect.

After having quoted a couple of theories, which, however, do not seem to the author sufficient to explain the symptoms described, he continues:

"We may therefore say that the picture we might, *a priori*, form of a tonic spasm of the diaphragm and that observed in my patient, completely correspond to one another. Moreover, from Duchenne's experiments on animals, we are acquainted with the symptoms of tonic diaphragmatic spasm produced by electric stimulation of the phrenic nerves. They agree in all essential points with the phenomena observed in my patient; only the results of percussion are not mentioned by Duchenne; however these fall away of themselves, as they are dependent merely on the low position of the diaphragm." In the human subject Duchenne has not seen tonic spasm of the diaphragm, but he quotes a case observed by Valette, in which death was caused by spasm in that muscle supervening during an attack of acute rheumatism. The symptoms, with the exception of the state of the abdominal muscles, agreed completely with those experimentally produced by Duchenne; "the abdominal muscles exhausted themselves in vain efforts to contract the base of the thorax." In this instance nothing was seen of these fruitless efforts on the part of the abdominal muscles, which were so very striking in our case. Duchenne explains this difference correctly by showing that with this painful rheumatic contraction of the diaphragm a corresponding antagonistic action of the abdominal muscles could not take place, because the pains would then be increased; the patient would, on the contrary, be compelled to exert himself to keep these muscles as quiet as possible.

In my patient the tonic spasm of the diaphragm which attained the greatest height during the attack, seemed not to have entirely ceased in the intervals, at least not in the latter period of the patient's life. The striking slowness of respiration and the invariably increased action during expiration appear to me to prove this. Certainly the diaphragm was movable in the intervals, but the excursion did not, on the deepest inspiration, amount to more than an inch, which is much less than the normal range. Certainly the position of the diaphragm in the intervals also corresponded to the normal, but an increase of the usual tension, a kind of subtetanic condition, is also possible without change of position,

There is consequently not the least doubt that there are asthmatic attacks whose cause lies in a tonic spasm of the diaphragm. In addition to the case now communicated, I remember two others where the paroxysms, if not quite as violent, were so like those here described that I have no doubt that they had the same origin. We have, moreover, the case observed by Wintrich, in which I find only the striking circumstance that the spasm of the abdominal muscles is not mentioned.

I have no doubt that the spasm of diaphragm is the most frequent and most important, but by no means the only cause of nervous asthma. To this opinion I was led even by the fact that, in reflecting on the various attacks of this kind in different patients, I find a very essential dissimilarity in the ele-

ments composing the attack, and in its whole bearing. In one case the spasm had a more inspiratory, in another a more expiratory character. At one time these, at another those respiratory forces were in increased activity. On account of the complicated nature of the respiratory act we can imagine different possibilities, whose existence must certainly, for the most part be proved.

Thus it appears to me, that the paroxysm in many cases is due to a mere clonic spasm in all or in the majority of the muscles of inspiration; for example, in hysterical asthma (I do not mean the hysterical spasm of the glottis). At least there was in the cases of this kind which I myself observed, always an extremely vehement panting respiration, with the co-operation of all the auxiliary muscles of inspiration, with a perfectly free passage through the larynx. Expiration took place with ease, although it, of course, in correspondence to the inspiration, was deeper and stronger than usual. However, I do not mean hereby to assert that other forms of asthma may not occur in hysterical patients, or that this form is found only in such patients.

Another possibility lies in paralytic states of the diaphragm. It is well known that this state has been observed in the human subject by Duchenne (especially in progressive muscular atrophy, then in lead-cachexy, hysteria, inflammation of the abdominal organs), and it has been produced in many instances, experimentally, by dividing the phrenic nerves. In many cases distinct asthmatis symptoms occurred; in some, on the contrary, the phenomena were not very considerable. Gerhardt, too (*Der Stand des Diaphragma*, Tubingen, 1860), correctly calls attention to the fact that the diaphragm obtains motor branches, not only from the phrenic nerve, but also from the 7th, 8th, 9th, 10th, 11th, and 12th intercostal nerves. It is, indeed, even *a priori*, probable, that such forms will be distinguished by their longer duration. The symptoms which depend on a paralysis of the diaphragm, especially the physical signs, are very accurately described by Duchenne, and particularly by Gerhardt. The diagnosis would, in the concrete case, not be more difficult than the diagnosis of diaphragmatic spasm.

As another possible case, of the existence of which there certainly is at present no proof, we may mention a spasm in the expiratory muscles alone, and principally in the abdominal muscles. In this case the muscles of inspiration must come into increased activity.

Lastly, there remains spasm in the bronchial muscles, which has the least amount of probability in its favour, but, nevertheless, is not inconceivable. What physical signs should we expect under such a condition?

As such a spasm would obstruct both respiratory acts, but expiration has a greater amount of forces at its command, both inspiration and expiration must certainly be laboured, prolonged and combined with great effort of the respiratory muscles, but this would be in a still higher degree the case with inspiration. The diaphragm would probably stand high, the thorax would be diminished in all directions, and the intercostal spaces would be more strongly drawn in, a very considerable increase of the expiratory, and especially of the inspiratory murmur, would necessarily be perceptible. Accordingly as the air, after having overcome the obstruction, could stream into the cells, or as this would be impossible, so must the character of the inspiratory murmur be either vesicular or undefined. In high degrees we might imagine the possibility of a moderate diminution of the resonance of the sound on percussion.

In glancing back briefly on what has been advanced, the conclusion must appear to be fully justified, that nervous asthma depends on different kinds of lesion of motor innervation. The form observed by Wintrich and by me, which depends on tonic spasm in the diaphragm, has been fully established. Scarcely doubtful can that form be considered which depends on paralysis in this muscle; all other possible cases must first be proved hereafter by accurate observations.

In a therapeutical point of view, spasm of the diaphragm had probably most to expect from the uninterrupted current; paralysis, on the contrary,

has most to look for from inductive electricity. (The employment of electricity was, in the above case, prevented by the sudden death of the patient). —*Medical Press and Circular, Feb.* 13, 1867, *p.* 140.

29—ON THE TREATMENT OF HOOPING-COUGH WITH HYDROPHENYL, OR BENZINE.

By Dr. Lochner.

In the year 1864, Dr. Lochner having been convinced that the ordinary remedies had no effect over the paroxysms of hooping-cough, sent his patients affected with that disease to the purifying rooms of the gas-works; but the inconvenience of taking children there in bad weather, and other circumstances, induced him to modify the treatment, which, however, he considered essentially to be a good one. In order to attain his object, he made use of one of the substances contained in the purifying chambers of the gas-works, namely hydrophenyl, which, when unpurified, is called benzine. He employed it at first in very small doses; but after he found that it had been given in large quantities in Germany for the destruction of trichinæ, he used it more freely, and he obtained, as he believes, the same results as from a residence in the purifying chamber of the gas-works. In order to assist the internal treatment, he poured a few drops of benzine on the bed of the patients, so that a smell similar to that from the gas-works should be constantly diffused through the room. Dr. Lochner tried the plan on his own child; and he states that the precursory symptoms of the hooping-cough lasted a week, and the disease itself only six days; and although the paroxysms were very violent, they did not amount in number to more than five or six in the twenty-four hours, and were shorter in duration than in other children. He gave this child from ten to fifteen drops of the benzine every day; and as soon as it was asleep, he sprinkled a few drops on the bed. He thinks that the best mode of administration is in a spoonful of water.—*British and Foreign Medico-Chirurgical Review, April*, 1867, *p.* 532.

30—A CASE OF RESUSCITATION AFTER TWO HOURS' APPARENT DEATH BY DROWNING.

By John Dennan, Esq.

On the afternoon of Tuesday, the 15th instant, about a quarter-past four, I received, in the absence of Mr. Obré, a summons to view a dead body just withdrawn from the ornamental waters in Regent's-park.

While on the way I entered somewhat minutely into the particulars with my guide, and on my arrival determined to examine the subject very carefully.

The man was apparently *quite dead*, and I heard the following statement, viz.:—That he had left his abode in perfect health, and joined in the general amusements on the ice, and was one of those at some distance from the shore when the catastrophe occurred. I particularly observed that the patient was intensely cold, from having been immersed some minutes, and having struggled in the water for more than half an hour. There was neither breathing nor heart's action, the pupils dilated, the jaws clenched, and the limbs contracted, so much so that the clothes had to be cut off before anything could be done to the patient.

A frothy mucus covered the mouth and nostrils, the body was much swollen, and I had it placed on an incline at an angle of about 35°, as the body was so very cold. I commenced, with the assistance of the two men, who brought him home, to try to restore warmth by degrees, rubbing the chest and limbs thoroughly and swiftly with ice and snow, cleansing the mouth and nostrils from time to time, and adopting Silvester's method of artificial respiration for more than two hours. After a quantity of frothy mucus was discharged,

slight signs of animation were perceptible, though so faint that I almost despaired.

I then had him well wrapped in blankets, placing large tins of hot water at the feet, and mustard poultices on the chest, while the body was well rubbed with warm flannel under the blankets. I continued this treatment for three-quarters of an hour, at the same time continuing to imitate the movements of breathing. A decided improvement then took place. The patient's jaws relaxed, and he appeared to breathe more freely. I then administered two tea-spoonsfuls of warm water, which caused him to vomit slightly. As soon as he commenced breathing freely I was able to give him a little warm tea, which he apparently relished. I may here observe that I could not induce him to take spirits.

The patient was now placed in a warm bed prepared for him, soothed to sleep, and all undue excitement prevented.

The patient was feverish for one or two days, but on the following Friday I had the pleasure of receiving a visit from him.—*Medical Press and Circular, Jan.* 30, 1867, *p.* 95.

31—ON FATTY DEGENERATION OF THE DIAPHRAGM.

By Geo. W. Callender, Esq., Assistant-Surgeon to St. Bartholomew's Hospital.

[No notice has previously been taken of this disease, nor has it been described in any systematic work on Medicine or Pathological Anatomy.]

A few cases have been referred to in which the diaphragm has become wasted in connexion with a decay of other muscles of the body, but these are widely different from those which I propose to relate, in which the muscle, for the most part in connexion with the heart, has been the seat of fatty degeneration, and, in some instances, by failure of its action, has been the immediate cause of the patient's death.

These cases came under my observation some years ago—1855–58,—whilst I held the appointment of Demonstrator of Morbid Anatomy at St. Bartholomew's Hospital, and consequently whilst it was my duty to make the medical *post-mortem* examinations. I publish them now because I am not infrequently hearing of cases of death from supposed fatty heart, but in which cases the earliest symptoms have been conspicuous for the remarkable disturbance and embarrassment of the breathing as distinguished from signs of failure of the cardiac action.

Case 1. My attention was first drawn to the occurrence of fatty degeneration of the diaphragm by the following circumstances:—J. M., a female, aged 59 years, married, was admitted into St. Bartholomew's Hospital on the 30th of December, 1855, under the care of Dr. Hue. There was nothing in her condition to indicate the speedy termination of her life, for she complained only, in addition to a slight bronchial inflammation, of being faint and ill, without being able to refer to any special symptoms. She was exceedingly fat, her breathing was shallow, and her respirations rapid. The bronchial affection was quickly recovered from, and she was on the eve of leaving the hospital, when, on the eleventh day after her admission, she was found by the night-nurse "struggling for breath," and died almost immediately.

I examined her body eighteen hours after death. Although an abundance of adipose tissue existed wherever fat is usually present, the voluntary muscles retained a natural appearance. The heart and liver were far advanced in fatty degeneration, as also was the diaphragm, to an examination of which I was guided partly by the obscure circumstances attending her death and the story of the embarrassed breathing, and partly by the pale and mottled appearance of the muscle as seen through the covering of peritoneum. The other organs and the vessels of the body were natural.

Case 2.—Some time later the following case came under my notice:—S. P. M., a female, aged 50 years, single, was admitted into St. Bartholomew's

Hospital, on January 1st, 1857, under the care of Dr. Hue, suffering from rheumatism of three weeks' duration, the present being her first attack. Inflammation of the pericardium, as well as of the endocardium, required especial treatment. She continued without any material change in the symptoms until the fourth day, when, at half-past two in the morning, she was seized with orthopnœa, with sudden and great depression as though from some severe shock, became livid, cold, and bedewed with a clammy perspiration. Within an hour she was almost pulseless, her breathing entirely thoracic, and so noisy that nothing could be determined with the stethoscope. Her abdomen was distended with flatus, and painful on pressure; its walls were rigid and motionless. Sinking rapidly, she died the same morning at nine o'clock. Mr. Wood, to whose kindness I am indebted for this history, adds: "I could not help feeling that her mode of death resembled that from peritonitis from ruptured intestine;" and he suggested that this might be a case of spoiled and fatty diaphragm.

On making the *post-mortem* examination, twenty-four hours after death, the body was found tolerably well nourished, but the integument was of a dusky purple, as with people dead from engorgement of the right heart and lungs. On opening the thorax the heart was seen considerably enlarged. The pericardium was adherent, as also were the pleuræ opposite the diaphragm and the lower parts of the chest. The cavities of the heart were dilated, and the left ventricle was also hypertrophied (thick-walled). The cusps of the mitral and of the aortic valves were thickened and fringed with deposits. The lungs and the right cavities of the heart were filled with dark fluid blood. The folds of the peritoneum were laden with fat, which tissue was present in only small quantities in other regions of the body. The remaining abdominal and pelvic organs presented a natural appearance. The skull and its contents were natural.

The diaphragm was pale, with the exception of those portions which arose from the bodies of the vertebræ, and retained their ordinary aspect. On closer inspection, the remainder of the muscle was seen to be mottled with pale, yellow specks; these resembled the markings often noticed in the muscular walls of a fatty heart. When examined under the microscope, this tissue was found degenerated into fat, the granules of which destroyed and took the place of the muscular structure. The heart was the seat of ordinary fatty degeneration; but the muscles of the body, such as the intercostals, the pectorals, and the psoæ, which were purposely examined after the condition of the diaphragm had been observed, were quite natural in appearance; and the same may be said of the voluntary muscles generally in the cases which remain to be described. A drawing of this diaphragm is in the museum of the hospital.—*Lancet, Jan.* 12, 1867, *p.* 39.

DISEASES OF THE ORGANS OF DIGESTION.

32.—ON DIPHTHERIA.

By Dr. W. Watson Campbell, Dunse.

[In the beginning of May, 1866, towards the end of his attendance upon a number of cases of diphtheria, Dr. Campbell caught the disease himself. At the commencement of the case, the nature of which he saw from the small white spots on each tonsil, he commenced with iron and wine, and used a gargle prepared with the permanganate of potash. At first the gargle was too weak, but on using it stronger the exudation disappeared. Complete recovery soon followed.]

On the 18th of May, I was asked to visit a young lady, residing at a distance of about eight miles, who was said to suffer from sore-throat. Here I may remark that her brother resided in the same street where the five cases last referred to occurred, and that he occasionally asked after the children while they were ailing, as he passed along. He visited his home while the

children were ill, and about ten days after he had been there I was requested to attend his sister. I found her suffering from diphtheria. The exudation was very adherent, of a dirty yellow colour, and extensive,—covering nearly both tonsils, the rim of the velum, and the anterior surface of the uvula. She was very feverish and prostrate. She had a shivering three or four days before she was seen, and this was followed by sore-throat, which gradually got worse till I saw her. Deglutition was very painful, and articulation difficult and indistinct. In the treatment of this case I immediately began with a gargle of the permanganate of potash (gr. x. to the ℥xx.), recommending it to be used very frequently. To insure its application to the whole affected surface, she was told to swallow a little of it now and then, in order that, should there be any trace of the disease further down than could be seen, it might be flushed (if I may be allowed the expression) with it as often as a little of it was swallowed. Iron and port wine were also used. This patient never went back a day from this time, if we except the retardation of cure by sequelæ. Next day the exudation was very much less, and in four or five days it had entirely disappeared; and, though the throat was raw and tender-looking, I was much pleased to find matters going on as they were. From the first application of the gargle her convalescence may be safely dated. From that time the pain began to subside, and deglutition and articulation became more easy. She went to the seaside about three weeks after my first visit, and though she had great weakness in the legs, and suffered from almost complete blindness from amaurosis for some time, she is now quite well.

I have no wish to extend this paper further than the subject requires, but must state that, since the last case came under my care, I have had other ten cases to attend, and that under the use of the permanganate-of-potash gargle, the tincture of the muriate of iron, and port wine, every one of these cases recovered rapidly. I would almost make one exception, and in this case—that of a lad about eighteen years of age,—there was only a slight weakness in the legs experienced for about fourteen days. Some of these cases I would certainly have despaired of without the aid of the permanganate of potash, so very severe did the attacks seem to be when I first saw them. At the present time I have a very bad case in hand. I was called upon to see him on the 30th of October. He had a shivering on the night of the 25th. On making my first call, his pulse was rapid and wiry, his face pale and anxious-looking, his skin clammy and moist, deglutition very painful, and articulation very indistinct. The same treatment was adopted in this as in that of the young lady noticed above. I saw him again on the 2nd of November. He was clear and bright-looking, the pain was greatly relieved, and articulation was very much improved. He felt and continues to feel better ever since he used the gargle. I saw him on the 4th again. The exudation, which was of a dirty yellow colour and very adherent, was nearly gone, and the throat was rather raw-looking. Whether the improvement will continue or not remains to be seen, but I have great hope that he will do well.

Perhaps I may be excused for referring to two or three points in my experience of this disease, which are somewhat interesting.

The communication of infection is not necessarily direct. Indeed, in none of the cases I have seen did the disease seem to pass directly from one to another, unless where it spread in the family, as in the first cases I have noticed. On five well-marked occasions, it appeared to have been carried by a third party to a distance varying from one to eight miles. On one occasion it reappeared in the family of the woman attended first in September, 1865, after an interval of six or seven months. Only during my attendance on the last two or three cases have I known scarlet fever to be present in the district.

In some cases of scarlet fever, I have seen whitish pellicles on the tonsils—not very unlike what I saw in my first case of diphtheria; but, otherwise, there was in every case quite enough—even putting the rash out of the question—to distinguish the scarlatinal from the diphtheritic exudation.

In no case of diphtheria did I ever observe an abundant muco-purulent dis-

charge from the nostrils; and though the tonsils are generally felt outside to be hard and large, yet I have never seen in this disease a single case of cervical cellulitis.

In all the cases of scarlatina where I have seen an exudation resembling that of diphtheria, there was not long afterwards a well-marked and frequently profuse discharge from the nostrils, and, in some of the cases, very extensive cervical cellulitis.

In some of the cases of diphtheria the exudation appeared to select, as its primary seat, the mucous membrane in the upper part of the larynx; and in some of these, by extension of the exudation, a modification of croup was caused.

In no case of scarlatina, even with intense throat affection, have I ever seen croupy symptoms arise to give evidence of the larynx being affected.

I am not aware that palsy is ever met with after scarlet fever, however severely the throat may have been affected, while palsy very frequently follows diphtheria.

Only in one case out of thirty-five that I have had under my care have I seen dropsy—œdema of the legs only—follow. Dropsy is comparatively frequent after scarlatina.

In such cases of diphtheria as I have tested the urine, the chlorides have never been found absent, and only in two or three cases have I detected albumen. In scarlet fever we expect a deficiency or absence of the chlorides, and are not surprised at the presence of albumen.

Notwithstanding all this, there may have been found, in the experience of others, more conditions common to both diseases than I have met with. I was certainly surprised at the reappearance of the disease in the same family after an interval of six months—a circumstance which has been known to occur in scarlatina.

With regard to the occasional resemblance of diphtheria to croup, I am disposed to think it accidental; and that the pellicle of the former differs from the false membrane of the latter in extent, in the rule of place, and in the latter being the result of true inflammation.

From my experience of this disease, I venture to differ from authorities such as Dr. Begbie, Sen., and Dr. Jenner, with regard to the disease being constitutional. My opinion is that it is not so primarily, but that it becomes so, not so much, perhaps, by the absorption of poisonous matter from the seat of the exudation, as by the effect that the presence of such exudation may have on the nerve centres, through the nerves distributed to the part on which the exudation has taken place. It may be objected that some cases have ended fatally without much local disturbance, and this by rapid prostration. Still the time required to effect this prostration, and the amount of exudation which will cause death in this way, may, as with other poisons, differ much in every case, whether acting indirectly or directly. The best reason, however, for supposing that the disease is local at first, is afforded by the success which has followed the local treatment, and also, by what was very apparent to me, that, on the whole, the more rapidly the local disease was removed, the less likely was the constitution to suffer.

Of twenty-three cases of diphtheria which occurred in my practice before I used the permanganate-of-potash gargle, ten died. Of the thirteen who recovered, four had paralysis to a greater or less extent. On the other hand, of the twelve cases which have occurred since (not including that under treatment), *none* died, and only *two* have had paralysis.

Since I thought of making this communication I have seen a letter from Dr. N. Evans, in the Medical Times and Gazette, of 27th Oct., in which the report of an interesting case is given, which corroborates very strongly my impression that the permanganate of potash may be safely allowed to exercise a remarkably beneficial effect when used perseveringly, and that even in the worst cases a cure may be hoped for, provided the larynx has not been affected.—*Edinburgh Medical Journal, Feb.* 1867, *p.* 727.

33.—ON CARBOLIC ACID IN DIPHTHERIA.

By Charles Sedgwick, Jun., Esq., Hollingbourn, Maidstone.

[Mr. Sedgwick has been in the habit of using diluted carbolic acid as a gargle in cases of diphtheria and ulcerated tonsils for the last four years. Although of a disagreeable taste he has not found that patients object to it after the first application, as it generally affords such great relief.]

I usually give it in the form of a gargle, but in children by swabbing the throat out freely with it on a piece of sponge. When the disease has been taken early I have not failed in a single case, but have lost some where it had gone too far for medical treatment to be of any service. Carbolic acid has a decided effect upon the false membrane thrown out. The following is the form I usually prescribe:—℞. Acidi carbolici ℥xx., acidi acetici ʒss., mellis ʒij., tinct. myrrhæ ʒij., aquæ q. s. ut fiat gargarisma ℥vj. The carbolic and acetic acids to be well shaken together, the mel to be added with the aqua gradually. With it I usually give tinct. ferri and quinine.—*Medical Times and Gazette, Feb.* 27, 1867, *p.* 216.

34.—BENEFICIAL EFFECT OF BELLADONNA IN A CASE OF SEVERE COLIC AND CONSTIPATION.

Under the care of Dr. Murchison, at the Middlesex Hospital.

[The patient was a married woman, 27 years of age. She had always enjoyed good health with the exception of an attack similar to the present one, about two years before. The present attack commenced, ten days before admission, with severe pains in the abdomen of a paroxysmal character, and always worse at night.]

From the first the attacks of pain had often been accompanied by violent vomiting; but for seven or eight days the bowels had acted daily. For at least two days before admission the bowels had not acted.

On admission, the patient was in great distress with pain in her abdomen and back, which bent her up double. The pain was paroxysmal, but the paroxysms followed one another in rapid succession. She described the pain as shooting from the abdomen down the anus as well as the legs. The urine contained no blood. There was not a trace of jaundice, and no tenderness of abdomen; but the paroxysms of pain were accompanied by violent retching and bilious vomiting. The pulse was 72; the skin felt cool; no external hernia could be discovered; and there was no blue line along the edge of the gums. The patient on admission was ordered a warm bath, poultices with laudanum to the abdomen, a large castor-oil enema twice a day, and a draught every four hours containing twenty minims of laudanum and of chloric ether in an ounce of peppermint water.

On Dec. 30th she had taken in the course of two days nearly half an ounce of laudanum, besides having a quarter of a grain injected into the skin; and she had had five copious injections of gruel and castor-oil, and two warm baths. But there had been no action whatever of the bowels, and the vomiting and pain continued as urgent as ever, so that she had had no sleep since admission. In addition, the pulse had risen to 108, the skin felt hot, the patient was more depressed, and there was decided tenderness of the left groin. Twelve leeches were now ordered to be applied to the abdomen, followed by linseed poultices: and a mixture was prescribed, consisting of castor-oil, half an ounce; liquor potassæ, twenty minims; tincture of opium, twenty-five minims; and pepperment water, an ounce and a half: to be taken every sixth hour.

The tenderness of the abdomen was considerably relieved by the leeches; but on Jan. 1st the patient had taken eight doses of the mixture, or four ounces of castor-oil and nearly three and a half drachms of laudanum, which had been retained, but without any action of the bowels, and with but little

relief to the pain of vomiting. The patient was now ordered a pill containing half a grain of extract of belladonna every four hours, with belladonna ointment to the abdomen, a warm bath at night, and a castor-oil enema twice a-day.

On the following morning, after taking four of the pills, and the pupils being moderately dilated, the patient had a copious feculent motion. This was the first action of the bowels for at least a week, and from that moment the pain and vomiting subsided. The pills were repeated twice daily, and the bowels continued to act regularly and copiously. On Jan. 8th the patient was discharged well.—*Lancet, Jan.* 19, 1867, *p.* 81.

35.—ON ENLARGEMENTS OF THE LIVER.

By Dr. Charles Murchison, F. R. S., Lecturer on the Practice of Medicine, and Physician to the Middlesex Hospital.

[In the following article those cases of hepatic disease are considered in which the enlargement is real (in some cases enlargement is simulated). Many divisions of these cases have been made, as Dr. Bright's, into smooth and irregular enlargements. Dr. Murchison thinks a division into painless and painful less open to exception.]

Among painless enlargements we have the so-called amyloid liver, the fatty liver, hydatid tumour of the liver, and simple hypertrophy.

Among enlargements, in which pain is a prominent symptom, we have congestion, catarrh of the bile-ducts, obstruction of the common duct and retention of bile, pyæmic abcesses, tropical abscess, and cancer.

The distinguishing characters of these several forms of enlargement may now be considered in detail.

I. *The waxy, lardaceous, or amyloid liver.*—The liver undergoes greater enlargement from the so-called waxy, or amyloid deposit, than from any other disease, excepting, perhaps, cancer. I have known the liver of an adult affected with this disease weigh upwards of 180, instead of 50 or 60 ounces, and the liver, of which I show you here a portion, weighed one-seventh instead of a twenty-fifth, of the entire body of the child from whom it was taken. Enlargement of the liver due to waxy or amyloid deposit may be recognized during life by the following characters:—

1. The enlargement is often great, so that the liver fills up a large portion of the abdominal cavity.

2. It is uniform in every direction, so that the form of the organ is not essentially altered. The area of hepatic dulness on percussion is increased in the median, dorsal, and axillary lines, as well as in the right mammary. The increase is greater in front than behind, because in the former situation there is greater room for growth. It is increased in an upward as well as in a downward direction, although mainly in the latter, the lower margin often reaching the umbilicus, or even the right groin; but nowhere is there any outgrowth from the normal contour. The abdomen is enlarged, and often there is a visible tumour below the right costal arch and in the epigastrium, but rarely, if ever, is there any bulging of the ribs themselves. Waxy enlargement of the liver moulds itself over adjacent organs, and has little tendency to cause displacement of the ribs by eccentric pressure.

3. On palpation, the portion of liver which extends below the margin of the ribs is very dense, firm, and resistant. There is no elasticity, and still less any feeling of fluctuation.

4. The outer surface is smooth, and the lower margin is more rounded than natural, regular, and free from all indentation. In this respect, however, rare exceptions occur, an ignorance of which may lead to errors in diagnosis. In rare cases waxy deposit in the liver coexists with cirrhosis, or with what are known as syphilitic cicatrices, and then the surface of the organ may be nodulated, or even broken up into irregular lobes, separated by deep fissures, the existence of which may lead to the suspicion that the enlargement is due

to cancer. In cases also of extreme enlargement they may be an exaggeration, so to speak, of the lobes into which the liver is naturally divided, deep fissures corresponding to the attachment of the ligaments. Some of you had an opportunity of observing a case of this sort under the care of my colleague, Dr. Greenhow, the particulars of which are given below. Cases have also been recorded by Professor Frerichs of Berlin, in which a waxy liver has presented a more or less lobulated form.

5. Waxy deposit in the liver has but little tendency to obstruct the portal circulation, and consequently ascites and enlargement of the subcutaneous veins of the abdominal wall are not common phenomena in its clinical history. When such indications of portal obstruction do occur, they are often due to pressure exerted on the trunk of the portal vein by lymphatic glands in the fissure of the liver enlarged from waxy deposit. Occasionally, also, fluid is effused into the peritoneum as the result of secondary peritonitis.

6. Jaundice is a rare symptom in waxy disease of the liver; and when it occurs, it is due for the most part to the pressure on the bile-ducts of enlarged lymphatic glands, or to the co-existence of catarrh of the bile-ducts.

7. Pain and tenderness are never prominent symptoms. The liver can be manipulated with impunity, and the patient complains only of a feeling of weight or tightness in the right hypochondrium, or of uneasiness from the pressure to which the stomach and intestines are subjected. But occasionally, and particularly where there is a syphilitic history, there is an attack of acute pain from intercurrent peri-hepatitis. In a case now under your notice the enlargement commenced in India, with severe pain in the right side, for which numerous leeches were applied; but the enlarged liver now exhibits its usual painless character. Frerichs also records a case where the disease supervened on protracted ague, and where "the first symptom was persistent cutting pains in the side."

8. The growth of the tumour is slow and imperceptible. It usually extends over several years.

9. Constitutionally, the symptoms are chiefly those of anæmia. There is no pyrexia; but the countenance is pale and sallow, the patient suffers from general debility, and the proportion of white corpuscles in the blood is slightly increased.

Other characters of no small moment in diagnosis, are derived from the spleen, the kidneys, the stomach, or the intestines being the seat of a similar morbid deposit to that producing the hepatic enlargement.

10. The spleen in most cases is enlarged, and often greatly, as well as the liver.

11. Waxy disease of the kidneys has peculiar characters of its own the presence of which, in any case of hepatic enlargement, would alone make it very probable that this enlargement was due to waxy deposit. These characters are—

a. An increased quantity of urine. Not uncommonly the patient voids three or five pints of urine in the twenty-four hours. This is the rule throughout the greater part of the course of the disease. Towards the termination only is the quantity diminished.

b. The urine is pale, of moderately low specific gravity (about 1012), free from any smokiness, and contains a considerable amount of albumen.

c. Casts of the renal tubes are often absent. When present, they may be of an epithelial or hyaline character; usually the latter. These hyaline casts, so far as my observation goes, never yield the so-called amyloid reaction with iodine and sulphuric acid; but, in exceptional cases, this reaction may be observed in some of the cast-off renal cells.

The persistent secretion of a large quantity of urine containing much albumen by a person who has never had general anasarca, will of itself warrant the presumption that the individual is suffering from waxy disease of the kidneys. In the contracted or gouty kidney there may also be no dropsy, and the quantity of urine may be increased; but then the specific gravity is remarkably low (often not exceeding 1002 or 1005), and albumen is present as a mere trace, or may be entirely absent.

12. The implication of the stomach and intestines in the waxy disease induces a tendency to vomiting and to obstinate diarrhœa from slight causes. Occasionally this diarrhœa is accompanied by tenesmus, and the patient may be thought to labour under dysentery; but post-mortem examination reveals no evidence of inflammation of the bowel. The diarrhœa appears to result from deficient absorption rather than from increased exhalation.

13. Here, as in many other maladies, the circumstances under which the disease usually makes its appearance are of considerable importance in diagnosis. Now there are certain conditions of the system which pre-eminently favour the advent of waxy disease. Among them may be mentioned the following:—

a. Long-standing purulent discharge, such as is particularly apt to happen in connexion with diseased bone or joints, and after surgical operations when the wound does not readily heal.

b. Constitutional syphilis. In a large number of cases of waxy disease the patients have been the subject of constitutional syphilis, which appears to act as a predisposing cause quite independently of its inducing disease of the bones or protracted discharges.

c. Tubercle of the lungs and of other organs must be regarded as a predisposing cause of waxy degeneration, although the enlargement of the liver common under such circumstances is oftener fatty than waxy. Of 52 cases of persons dying from tubercle, and whose autopsies I have recorded, the liver was fatty in 20, and waxy in 6, and in 3 of the 6 there was likewise caries of the bones. Still, of the 52 cases, 14 had waxy disease of either the kidneys, the liver, or spleen; or one in 3¼. The proportion of tubercular males in whom waxy disease was found was more than double that of females. Thus, of 33 tubercular males, there was waxy disease in 11, or 1 in 3; whereas of 19 tubercular females, only 3, or 1 in 6⅓, had waxy disease.

d. Many chronic diseases that seriously impair the general nutrition probably predispose to waxy degeneration, which has thus been met with as an occasional sequel of protracted ague, cancer, &c.—*Lancet, April* 6, 1867, *p.* 413.

DISEASES OF THE URINARY ORGANS.

36.—ON THE TREATMENT OF DIABETES MELLITUS.

By Sir Henry Marsh, M. D., Bart., Physician in Ordinary to the Queen in Ireland.

A perfectly successful mode of treatment yet remains to be discovered. Every step which is made towards the attainment of this desirable object, is in itself valuable, and may also lead to still further advances; till, at length, we may become possessed of the ability to rescue a considerable proportion of those who are affected with the disease, from a lingering and miserable death.

A well-marked case of the diabetes was, not long since, placed under my care. From the wish to afford all possible relief, I anxiously referred to every source whence useful information might probably be derived, and was thereby led to an attentive perusal of the several treatises and detached cases of this disease, which have, from time to time, appeared. In the works of the older writers, little, if any valuable matter respecting the treatment will be found; indeed, until the period at which Dr. Willis made the curious discovery of the existence of sugar in diabetic urine, all the recorded histories of this complaint are marked by vagueness and uncertainty; and are as applicable to any form of diuresis, as to that in which the urine is saccharine. While employed in turning over the several works written on this subject, my attention was particularly arrested by the following important considerations: First, in many of the cases whose histories are recorded, the earliest disturbance in the general health could distinctly be traced to some cause acting upon the skin, and producing derangement of its functions. Secondly, *every* case of the diabetes mellitus is accompanied with a peculiarly morbid con-

dition of the skin. In truth, I know not any disease in which this symptom is so uniform and so remarkable. Thirdly, none of the remedies employed produced the slightest beneficial effect, until the skin began to relax, and a sweat to appear on the surface.

These considerations led me to turn my attention more particularly to the state of the skin, and suggested the probability of advantage arising from the application of *vapour* to the whole surface of the body. The vapour bath was employed. The impression made upon the disease by the frequent use of this remedy surpassed my expectations. Its salutary effects, in giving a new action to the skin, were immediately perceptible. The perspiration having been afterwards maintained by warm clothing, and continued bodily exercise, the patient daily improved in health; and at length quitted the hospital, under the conviction of his disease being wholly removed. Before entering upon the particulars of this case, I shall briefly state two observations obtained, the one from Dr. Rollo's book, the other from a treatise written by Dr. Latham. These observations appear to me peculiarly important; as in both instances, the only operative remedies were those which established upon the surface an abundant perspiration. In the first, the effect was produced by the tepid bath; in the second, by bodily labour. To these facts an additional value should also be attached, because, unwarped by any theory, they are simply and as it were accidentally stated.

In the second edition of Rollo on Diabetes, p. 183, there is a communication from Dr. Gerrard of Liverpool. In the case given by Dr. G., the first observable symptom was a diminution of habitual perspiration; afterwards it totally ceased; and at length "the cuticle became unnaturally dry, harsh, and rough, and to all appearance dead, and incapable of perspiration, absorption, or any kind of transmission." With this state of the skin was connected the ordinary symptoms; thirst, increased appetite, languor, debility, and saccharine diuresis.

In the sole view of determining, by experiment, the existence or non-existence of cutaneous absorption, this patient was immersed, every successive or alternate day, in water raised to a pretty high temperature; the weight of his body having been carefully ascertained, both before and after each immersion. An attempt was made to restrict him to animal diet: medicine of every kind was intentionally withheld. The warm bath was first used on the 12th of February. On the 22nd, there was a considerable diminution of the quantity of urine; its smell was urinous, and the extract less sweet; the weight of the body was increased, and, it was observed, the dead cuticle began to come off.

24th. On this day he used the bath at the temperature 100°, and remained in it fourteen minutes.

25th. "The dead cuticle is peeling off; and he is obviously improving in every respect, and gaining weight." Bath continued at the same temperature, and employed every day till the 20th of March.

For several days, at the beginning of March, he lost ground, in consequence (as I conceive) of considerable disorder in the stomach and bowels. During the continuance of this derangement in the functions of the abdominal viscera, the cuticle did not come away as before, nor did the patient sweat. On the 21st of March, the non-existence of cutaneous absorption having been satisfactorily proved, the warm bath was laid aside.

28th. "He has had a considerable and general perspiration last night; his thirst and appetite are moderate, and he is quite free from pain." At this time the disorder of the bowels appeared to subside; the functions of the skin became more natural; and he began evidently to gain ground.

April 7th. He used the warm bath to cleanse his skin, when a large quantity of the dead cuticle came off. Cold bath ordered.

8th. Urine four pounds thirteen ounces; it is not sensibly sweet. He felt very warm and comfortable after the cold bath, and rested well at night; his appetite and thirst are moderate. He was now a second time thrown back by disorder in the digestive organs; but soon afterwards he began again to improve.

29th. Urine three pounds three ounces. "He had a copious perspiration in the night, which continued about four hours."

May 1st. "He perspired much in the night, but it does not weaken him."

6th. On this day it was discovered, that the patient did not adhere to the plan of animal diet longer than the first fourteen days. During the remaining (as is distinctly stated by the author himself) "he partook with the other patients, in the common mixed diet of the house."

17th. "Urine four pounds ten ounces; it is neither sweet, nor in any over proportion to the fluids taken in; nor will it ferment, although he has lived chiefly on vegetable matter and milk, since the 6th instant. He has had copious perspirations these two nights past."

25th. "He was discharged from the Infirmary, to all appearance cured of the disease; which to his own thinking has long been the case; and to the opinion of his being *even cured*, I have no hesitation in subscribing."

This case, the details of which are in Dr. Rollo's book, possesses peculiar value. Medicine was not administered; nor was animal diet, except during the first fourteen days, adhered to; and yet there is here presented to us as perfect an instance of recovery as any on record. To what then is the cure of this patient to be ascribed? Not certainly to a few days' adherence to animal diet; for it was nearly three months after the exclusively animal regimen had been laid aside (and at a time too, when the diet was chiefly vegetable), that the most marked and decided amendment of the symptoms was manifested. Since, therefore, no medicine was given, and little, if any effect, can justly be attributed to the short restriction to animal diet, it obviously follows that the warm bath (which was not used as a remedy, nor was its efficacy in the least suspected) was, in reality, the one and only efficient means of cure. This opinion is likewise corroborated by the fact, that, in the same proportion as the morbid cuticle was detached, and abundant perspiration established, so did all the symptoms of the disease subside. The second observation derived from Dr. Latham's book, I shall quote in his own words:—

"The first case I remember to have seen, was in the Radcliffe Infirmary at Oxford, under the care of the late Dr. Parsons, then Clinical Lecturer in the University; the impression of its being an incurable disease, which the medical pupils received from the Professor, was sufficiently fixed in their minds by the inefficacy of the remedies which were from time to time prescribed for the patient's relief; worn out with expectation, and despairing at last of receiving any benefit, he was at his own desire put upon the list of out-patients, and requested to come occasionally to the Infirmary, that the pupils might have the opportunity of seeing the progress of the disease, rather than with any expectation of a prosperous issue to the complaint: a few weeks elapsed before he returned to us, and to the great astonishment of all we found him improved, not only in his appearance, but also very materially in the urinary discharges. His own account was, that, weary of life, and destitute of every ray of hope, he had wandered about, as well as his strength would allow him, for a few days amongst his fellow-labourers of the neighborhood, and finding, from this exertion, that his strength did not decrease, he was tempted to take a part in the work that was going forwards; that a copious perspiration very soon ensued, under which he did not feel himself weakened in bodily powers, but rather improved in spirits; that he renewed the same sort of easy occupation from day to day, with the same comfortable event; and that at last not only his spirits but his bodily strength was manifestly increased; his urine, however, was then neither perfectly natural in smell or taste or quantity, although in all these respects it was certainly much amended. He visited the Infirmary a few times afterwards at irregular intervals, and at last ceasing to attend, we concluded, from the progress made towards recovery, whilst he continued his attendance, that he probably had been fortunate in experiencing a cure. And had we been then as convinced of the efficacy of animal food in diabetes as we now are, we should probably have thought that the provincial diet of that district might possibly have contributed to his relief, for the poorer sort of labourers usually

lived upon a large onion with fat bacon, and no great portion of bread." I fancy the reader will be disposed rather to attribute the amendment in the state of this patient's health, to the free perspiration caused by bodily labour, than to the large onion, or even the fat bacon.

I shall now proceed to relate the principal facts of the case of the diabetes mellitus, which I have lately had under my care; and which strongly illustrates the value of those remedies, by which a copious and continued diaphoresis is most certainly produced.

—— Riddal, aged 20, a shoemaker; hair and eyes dark; conjunctiva clear and pearly; lines of the muscles distinctly marked; complexion sallow; emaciation extreme; veins prominent and full; skin a dingy yellow, permanently arid, and glued apparently to the subjacent muscles; gums ulcerated; a small unhealthy ulcer on the right cheek; epigastrium tumid; tongue florid at margin and point, and covered in other parts with a thin whitish secretion; extreme listlessness, languor, and debility; a sensation of weakness (referred to the knees) so great, that it is with difficulty the weight of the body is supported; dimness of vision; sleep broken and disturbed; he is much distressed during the night by spasms in the lower extremities; though constantly placed before a large fire, a sensation of creeping coldness is always present. Appetite inordinate; thirst unquenchable; mouth clammy; digestion rapidly performed; a craving sensation recurs soon after food has been taken; costiveness; there is a constant desire to pass water, which is increased during the night. From twenty to twenty-two pounds of urine are passed ordinarily during the twenty-four hours; the bubbles remain on its surface; it is limpid and almost colourless; its smell peculiar, and not easily to be described; its taste very sweet; when evaporated there remains an abundant extract resembling coarse brown sugar; pulse 88, full and throbbing; neither cough nor dyspnœa; such were the symptoms which manifested themselves at the time of his admission into hospital, which was towards the end of the month of December.

I obtained from him the following account of the state of his health, previously to the time of his admission: In the beginning of last November, he embarked at Liverpool, in a vessel destined for Dublin. He was then in perfect health; a violent storm came on; the loss of the vessel was hourly expected. He was four days at sea, and during the greater part of that time was to his knees in water; he was chilled with cold; and for the last two days there was not any supply of provisions. After quitting the vessel, he felt himself constantly chilly, and could not by any means (to use his own expression) "get warmth into him." A thirst so intense came on, that he was perpetually swallowing large draughts of water; he preferred cold drinks. In describing the symptoms, he dwelt a good deal upon an unusual dryness of the skin, and a total absence of perspiration, since the time of his sea voyage; his sight also grew dim; his bowels were costive. In consequence of the excessive keenness of his appetite, his complaints became a subject of ridicule; languor and debility, notwithstanding the large supplies of food, daily increased; and at length he found himself so weak, that he was obliged to abandon his ordinary occupation, and make the best of his way to town to seek relief.

On the first of February, ten ounces of blood were removed by the lancet; the serum was milky; the crassamentum firm; the loss of blood did not in any manner affect the symptoms. From this time, on to the second of March, mercury was used, externally and internally, in large quantities; no fetor of the breath, no increased secretion of saliva, nor any other symptom indicating the presence of mercury in the system, was perceptible. Only whilst using that medicine, he evidently lost ground and became, by degrees, so very weak, that he was no longer able to leave his bed. His bowels were regularly evacuated by doses of castor-oil and tincture of senna. His diet was chiefly vegetable; his ordinary drink the inf. lin. and water.

On the 2nd of March the vapour bath was used for the first time. No very perceptible effect was produced. This remedy was repeated on the 9th, 12th,

16th, and 26th. The symptoms still unabated: there was, perhaps, some slight accession of strength.

From the 2nd to the 27th of April, all treatment, except daily purgation, was laid aside. The flow of sweet, and almost colourless urine, in the course of the day and night, often exceeded twenty-four pounds. The necessity of assuaging his thirst, and voiding his urine, was so continued during the night, that he could scarcely obtain any sleep. He was now reduced to a state of alarming debility. On the 27th of April, he was again placed in the vapour bath; half an ounce of the tincture of opium was mixed with the water which was to be converted into vapour. He remained in the vapour bath twenty minutes. On being replaced in bed, syncope came on, from which he recovered very slowly; he then became feverish and hot; at length the skin gave way, and the whole surface of the body was soon covered with sweat. He felt, he said, immediately relieved; and on the following day was much better.

On the 4th of May, he was again put into the vapour bath, to which the tincture of opium, as before, was added. There was not on this occasion, any tendency to faintness: it excited copious perspiration, and he had a sound and refreshing sleep.

On the 10th of May, the following note was taken of his case: Strength improves daily; he feels much less languid; skin soft and perspiring; pulse 88; a whitish secretion covers the tongue; appetite less craving; improved sleep; he grows fat; gums continue ulcerated and sore; and the ulcer on the inferior maxilla is still open.

May 18th. The urine, almost colourless and very sweet, amounted during the preceding day and night, to full twenty-four pounds. His thirst was very urgent. His weight on this day was seven stone ten pounds.

May 22nd. A temporary diarrhœa, with griping pain, was produced by repeated doses of colocynth pill. The urine, during the increased action of the bowels, was observed to assume an amber colour, and to acquire a urinous odour, to be much diminished in quantity, and to have a taste less sweet. The tongue was cleaner; the fæces yeasty; the mouth parched; no perspiration; skin very itchy.

May 30th. Urine, though more amber-coloured, amounts to twenty-one pounds; pulse 100; no perspiration; an exclusively animal diet, with lime-water and milk, had been for some time enjoined: the patient, however, devoured in secret whatever of vegetable food he could procure; he said that much meat at a time lay heavy on his stomach, and greatly oppressed him.

June 3rd. A remarkable change in the symptoms was observed; for the last twenty-four hours the urine did not exceed eight pounds; during the preceding day and night perspiration flowed generally and profusely; there was a great accession of strength, and diminution of thirst and appetite. The abundant and continued sweating was produced by laborious exercise, while the body was enveloped in thick flannel, and the weather unusually warm. The first efforts of bodily labour were difficult and reluctant. The patient in the morning, when commencing the work of the day, could hardly move his spade; he was however, prevailed on to persevere; by-and-by he began to work with more ease to himself; and before the close of the day, when perspiration was fully established, the labour was easy and the fatigue trifling. From this period to the beginning of July, medicine of every kind was abandoned. He worked very hard every day; was warmly clad, and sweated much. His food was principally vegetable; he daily gathered strength and weight; enjoyed sound and undisturbed sleep, and felt himself so far relieved, that he was resolved to return immediately to his home and former occupation. From the slightly saccharine taste of the urine, and the continued ulceration of his gums, I strongly urged that he should not yet remove himself from medical superintendence.

July 27th. Bowels costive; urine sweet, light-coloured, and moderate in quantity; tongue much cleaner; free perspiration; he rose but once during the night; thirst, though much abated, continues; weight eight stone thir-

teen pounds. For several days past he had ceased to work; the vapour bath has not been used, nor any medicine given; a perspiring state of the skin, however, has continued.

August 4th. He has been for some days restricted to a diet exclusively animal; he has adhered strictly (as far as I could learn) to the regimen prescribed; his ordinary drink was milk with lime-water and beef-tea; the weather was very warm, and the patient's body entirely enveloped in thick flannel. An itchy, slightly-elevated, pale-red eruption was thickly and universally diffused over the surface of the body. His pulse beat steadily 120 strokes in a minute, and was throbbing and full.

August 10th. Pulse still 120. Diet consists in eggs, beef, mutton, soup, and milk. The serum of blood taken yesterday from his arm was white, like milk; sixteen ounces of blood were at that time removed; his strength, by this evacuation, was not in any degree impaired; the pulse fell to 104; perspiration continues; urine, within the last twenty-four hours, has amounted to eight pounds; the taste not sweet; the colour a deep amber; sleep natural. This day he complains of thirst, which has not been the case for several days past.

On the 12th of August, after a meal of fat meat, he was seized with severe vomiting and retching, and spent a feverish and restless night. On the following day, the pulse throbbed strongly, and rose to 120; he loathed food of every kind, had intense headache, panted for breath, and seemed like one suffocating. Fourteen ounces of blood were removed; the appearance of the serum was altogether altered; it was now perfectly transparent, and had a slightly greenish tinge; those urgent febrile symptoms he attributes to the animal regimen, from which he had not for some days deviated. He said that fat or rich meat particularly disagreed with him. Urine slightly saccharine; much more deeply colored, and considerably less abundant; skin thickly covered with an eruption of the same nature as that already described. The dyspnœa was so urgent that it gave to his countenance an expression of wildness. He was very restless, and continually changed his position. His skin was intensely hot. The flannel dress was laid aside, and he lay uncovered, except by a single sheet. His thirst was not to be appeased, and his appetite was wholly extinguished; the epigastrium was tumid and painful. By pressure at that region of the abdomen, the dyspnœa and suffocative sensation were very much augmented. Leeches were frequently and numerously applied at the epigastrium; the bowels maintained in a lax state by the daily exhibition of purgatives, saline draughts repeatedly administered, and opium, in large doses, given at night. After each application of the leeches, the respiration became freer and easier. In a few days, the febrile symptoms subsided, and left him weak, languid, and emaciated. The rapidity, however, with which he regained health and strength after the cessation of febrile action was remarkable: his skin continued soft and moist, but not profusely perspiring; his pulse did not rise beyond eighty in a minute; his sleep was undisturbed; his appetite moderate; and there did not remain any inordinate thirst. The quantity of urine varied from six to eight pounds, during the day and night; it was rather light-coloured; the taste salt and slightly sweet; he weighed eight stone four pounds. Under these circumstances, towards the end of the month of September, he quitted the hospital. I saw him on the first of January, 1822. There was not any return of the symptoms; the skin retained its natural and softened feel; he weighed eight stone five pounds; his pulse was moderate; the expression of his countenance very much improved; though not exempt from thirst, it gave him no annoyance; his tongue was whitish; he felt strong, and alive to every enjoyment; he worked at his trade as a shoemaker from an early hour in the morning, with little intermission, until late at night; his diet consisted of bread, butter, occasionally meat, fish, potatoes, and gruel; the gums were very slightly ulcerated; the bowels without medicine, were daily evacuated; the general quantity of urine, in the course of a day and night, varied from six to seven pounds; taste salt; slightly saccharine; colour still paler than natural.

Such are the leading facts which belong to this case. I regret that the

specific gravity of the urine was not at any time ascertained, and that this fluid was not, during the progress of the disease, subjected to chemical analysis. Attention to these points would have rendered the history of the case much more complete. Such as it is, however, it exhibits, in a striking point of view, the powerful effects of copious perspiration produced by the vapour bath and muscular exertion, in controlling and restraining the symptoms of the diabetes. That many have attempted the cure of this disease, by diaphoretic remedies, I am well aware; but the attempt has been made rather through the medium of medicines taken into the stomach, than by means of remedies designed to act directly upon the skin. That internal remedies should have failed is not surprising, when we consider that the constitution of a person laboring under this affection will resist the action of the most powerful medicines, even when exhibited in the largest doses. It is singular to what an extent opium, antimony, and other drugs may be administered, and yet little or no effect be produced. The warm bath has been used—but it has been used only occasionally; it has been employed as a secondary remedy, as one of minor importance, and not as one, which, if properly managed, is of itself sufficient to effect a cure. Its daily employment for weeks, nay months, may be requisite to bring about that relaxed and freely perspiring state of the skin, without which, whatever temporary abatement in the symptoms, or diminution in the flow of urine, may have taken place, not one step has, in reality, been made towards the accomplishment of a cure.—*Medical Press and Circular, Jan.* 16, 1867, *p.* 49.

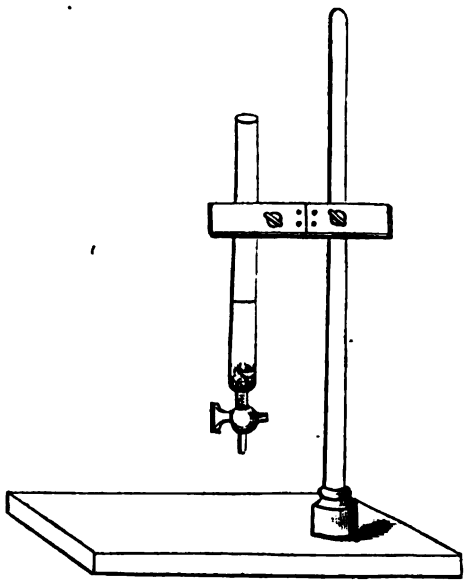
37.—A SEDIMENT TUBE FOR THE MORE READILY COLLECTING FROM THE URINE TUBE-CASTS AND OTHER OBJECTS FOR MICROSCOPIC EXAMINATION.

By Dr. W. R. Basham, Physician to the Westminster Hospital.

I have frequently suffered so great a loss of time in searching for tube-casts and other objects of interest in the urine of those suffering from renal disease, that I venture to think that a very simple apparatus which I have adopted for obtaining the lowest portions of the sediment, without disturbance of the upper portion, and thus finding, without loss of much time, the objects sought for, may be found of service to the profession, and particularly to misroscopic observers.

It frequently happens, in using the ordinary conical-shaped urine glass for collecting the sediment in urines, that in pouring off the upper stratum the sediment is so disturbed and the objects so diffused, that drop after drop is placed on the microscope stage with a negative result. It requires a large amount of patience to go through some eight or ten sample drops and find nothing, and still to persevere till rewarded by finding an object typical of the stage or form of disease from which the patient is suffering. I have for some time used a sediment tube of glass constructed with a tap, by turning which only the lowest portion of the sediment, and that which is richest in microscopic objects, is permitted to fall on the glass stage of the microscope. By this means no disturbance of the sediment can occur from pouring off, and the minutest sized drops can be brought into view. The accompanying woodcut will best illustrate the simplicity of this method. The tube should be about three-quarters of an inch in internal diameter, and, including tap and orifice, ten inches long. It may be kept in perpendicular position by any ordinary tube support. The most advantageous mode of using this sediment tube, if the quantity of urine to be examined microscopically be six or eight ounces, is to pour this into an ordinary conical-shaped urine glass, and allowing this to rest for an hour or more, carefully to decant off to within about two ounces, and pour this into the sediment tube. The sediment in an hour or two will have collected sufficiently, and by turning the tap a minute drop may be allowed to descend on to the microscope stage, and being covered with a slip, will be found to exhibit whatever microscopic objects

of importance may be contained in the urine. A great saving of time is thus gained, and where formerly I have spent an hour or more in, perhaps, fruitlessly searching through samples of urines from different patients, I now can



satisfactorily complete the examination in a few minutes. Messrs. Griffin and Sons, of Garrick-street, Longacre, have made these tubes for me, and they can be supplied by them for a few shillings.—*Lancet*, *March* 2, 1867, *p.* 269.

38.—MOVEABLE KIDNEY.

Moveable kidney is not unfrequently diagnosed during life, but it is rarely that we have an opportunity of seeing this abnormality after death; indeed, some authorities throw great doubt upon its occurrence at all. It has happened more than once that cases in which this diagnosis was confidently made have proved after death to be cancerous disease of the stomach. A few weeks ago, however, Mr. N. Heckford accidentally came across a well-marked instance of this peculiarity in the body of a woman who had died of apoplexy. The right kidney was freely moveable in any direction—so much so that it could be pushed on to the vertebral column. The left resembled its fellow in this respect, but in a far minor degree. Within a fortnight after this, a second example of this condition was discovered after death. As in the former case, the right kidney was the more mobile of the two.—*Lancet*, *March* 23, 1867. *p.* 363.

SURGERY.

AMPUTATIONS, FRACTURES, &c.

39.—ON A NEW METHOD OF TREATING COMPOUND FRACTURE, ABSCESS, &c.

By Joseph Lister, Esq., F. R. S., Professor of Surgery in the University of Glasgow.

[How is it that an external wound leads to such grave results in cases of fracture? Is it not probably by the atmosphere inducing decomposition of the blood which is effused in greater or less amount around the fragments and among the interstices of the tissues, and, losing by putrefaction its natural bland character, and assuming the properties of an acrid irritant, occasions both local and general disturbance.]

We know that blood kept exposed to the air at the temperature of the body, in a vessel of glass or other material chemically inert, soon decomposes; and there is no reason to suppose that the living tissues surrounding a mass of extravasated blood could preserve it from being affected in a similar manner by the atmosphere. On the contrary, it may be ascertained as a matter of observation that, in a compound fracture, twenty-four hours after the accident, the colored serum which oozes from the wound is already distinctly tainted with the odour of decomposition, and during the next two or three days, before suppuration has set in, the smell of the effused fluids becomes more and more offensive.

This state of things is enough to account for all the bad consequences of the injury.

The pernicious influence of decomposing animal matter upon the tissues has probably been underrated, in consequence of the healthy state in which granulating sores remain in spite of a very offensive condition of their discharges. To argue from this, however, that fetid material would be innocuous in a recent wound would be to make a great mistake. The granulations being composed of an imperfect form of tissue, insensible and indisposed to absorption, but with remarkably active cell-development, and perpetually renovated as fast as it is destroyed at the surface, form a most admirable protective layer or living plaster. But before a raw surface has granulated, an acrid discharge acts with unrestrained effect upon it, exciting the sensory nerves, and causing through them both local inflammation and general fever, and also producing by its caustic action a greater or less extent of sloughs, which must be thrown off by a corresponding suppuration, while there is at the same time a risk of absorption of the poisonous fluids into the circulation.

This view of the cause of the mischief in compound fracture is strikingly corroborated by cases in which the external wound is very small. Here, if the coagulum at the orifice is allowed to dry and form a crust, as was advised by John Hunter, all bad consequences are probably averted, and the air being excluded, the blood beneath becomes organised and absorbed, exactly as in a simple fracture. But if any accidental circumstances interfere with the satisfactory formation of the scab, the smallness of the wound, instead of being an advantage, is apt to prove injurious, because, while decomposition is permitted, the due escape of foul discharges is prevented. Indeed, so impressed are some surgeons with the evil which

may result from this latter cause, that, deviating from the excellent Hunterian practice, they enlarge the orifice with the knife in the first instance and apply fomentations, in order to mitigate the suppuration which they render inevitable.

Turning now to the question how the atmosphere produces decomposition of organic substances, we find that a flood of light has been thrown upon this most important subject by the philosophic researches of M. Pasteur, who has demonstrated by thoroughly convincing evidence that it is not to its oxygen or to any of its gaseous constituents that the air owes this property, but to minute particles suspended in it, which are the germs of various low forms of life, long since revealed by the microscope, and regarded as merely accidental concomitants of putrescence, but now shown by Pasteur to be its essential cause, resolving the complex organic compounds into substances of simpler chemical constitution, just as the yeast plant converts sugar into alcohol and carbonic acid.

A beautiful illustration of this doctrine seems to me to be presented in surgery by pneumothorax with emphysema, resulting from puncture of the lung by a fractured rib. Here, though atmospheric air is perpetually introduced into the pleura in great abundance, no inflammatory disturbance supervenes: whereas an external wound penetrating the chest, if it remains open, infallibly causes dangerous suppurative pleurisy. In the latter case the blood and serum poured out into the pleural cavity, as an immediate consequence of the injury, are decomposed by the germs that enter with the air, and then operate as a powerful irritant upon the serous membrane. But in case of puncture of the lung without external wound, the atmospheric gases are filtered of the causes of decomposition before they enter the pleura, by passing through the bronchial tubes, which, by their small size, their tortuous course, their mucous secretion, and ciliated epithelial lining, seem to be specially designed to arrest all solid particles in the air inhaled. Consequently the effused fluids retain their original characters unimpaired and are speedily absorbed by the unirritated pleura.

Applying these principles to the treatment of compound fracture, bearing in mind that it is from the vitality of the atmospheric particles that all the mischief arises, it appears that all that is requisite is to dress the wound with some material capable of killing these septic germs, provided that an substance can be found reliable for this purpose, yet not too potent as caustic.

In the course of the year 1864, I was much struck with an account of the remarkable effects produced by carbolic acid upon the sewage of the town Carlisle, the admixture of a very small proportion not only preventing odour from the lands irrigated with the refuse material, but, as it was stated, destroying the entozoa which usually infest cattle fed upon such pastures.

My attention having for several years been much directed to the subject of suppuration, more especially in its relation to decomposition, I saw that such a powerful antiseptic was peculiarly adapted for experiments with a view to elucidating that subject, and while I was engaged in the investigation the applicability of carbolic acid for the treatment of compound fracture naturally occurred to me.

My first attempt of this kind was made in the Glasgow Royal Infirmary in March, 1865, in a case of compound fracture of the leg. It proved successful, in consequence, as I now believe, of improper management; subsequent trials have more than realized my most sanguine anticipations.

Carbolic acid* proved in various ways well adapted for the purpose.

* Carbolic acid is found in the shops in two forms—the glacial or crystalline, solid at ordinary temperatures of the atmosphere; and the fluid, which sometimes passes under the name of Creasote. The fluid variety is sold in various degrees of purity. The crude forms are objectionable from their offensive odour; but the properly rectified product is almost fragrant. Different samples, however, differ much in energy of action, and hence, though I have hitherto employed the fluid kind in compound fracture, it would probably be better to use the crystallised form, melting it by placing the vessel containing it in warm water for a few minutes. Carbolic acid is sparingly absolutely insoluble in water, but dissolves readily in various organic liquids, such as the essential or fixed oils or glycerine.

exercises a local sedative influence upon the sensory nerves; and hence is not only almost painless in its immediate action on a raw surface, but speedily renders a wound previously painful entirely free from uneasiness. When employed in compound fracture its caustic properties are mitigated so as to be unobjectionable by admixture with the blood, with which it forms a tenacious mass that hardens into a dense crust, which long retains its antiseptic virtue, and has also other advantages, as will appear from the following cases, which I will relate in the order of their occurrence, premising that, as the treatment has been gradually improved, the earlier ones are not to be taken as patterns.

Case 1.—James G., aged 11 years, was admitted into the Glasgow Royal Infirmary on August 12th, 1865, with compound fracture of the left leg, caused by the wheel of an empty cart passing over the limb a little below its middle. The wound, which was about an inch and a half long, and three-quarters of an inch broad, was close to, but not exactly over, the line of fracture of the tibia. A probe, however, could be passed beneath the integument over the seat of fracture and for some inches beyond it. Very little blood had been extravasated into the tissues.

My house-surgeon, Dr. Macfee, acting under my instructions, laid a piece of lint dipped in liquid carbolic acid upon the wound, and applied lateral pasteboard splints padded with cotton wool, the limb resting on its outer side, with the knee bent. It was left undisturbed for four days, when, the boy complaining of some uneasiness, I removed the inner splint and examined the wound. It showed no signs of suppuration, but the skin in its immediate vicinity had a slight blush of redness. I now dressed the sore with lint soaked with water having a small proportion of carbolic acid diffused through it; and this was continued for five days, during which the uneasiness and the redness of the skin disappeared, the sore meanwhile furnishing no pus, although some superficial sloughs caused by the acid were separating. But the epidermis being excoriated by this dressing, I substituted for it a solution of one part of carbolic acid in from ten to twenty parts of olive oil, which was used for four days, during which a small amount of imperfect pus was produced from the surface of the sore, but not a drop appeared from beneath the skin. It was now clear that there was no longer any danger of deep-seated suppuration, and simple water-dressing was employed. Cicatrisation proceeded just as in an ordinary granulating sore. At the expiration of six weeks I examined the condition of the bones, and, finding them firmly united, discarded the splints; and two days later the sore was entirely healed, so that the cure could not be said to have been at all retarded by the circumstance of the fracture being compound.

This, no doubt, was a favourable case, and might have done well under ordinary treatment. But the remarkable retardation of suppuration, and the immediate conversion of the compound fracture into a simple fracture with a superficial sore, were most encouraging facts.

Case 2.—Patrick F., a healthy laborer, aged 32, had his right tibia broken on the afternoon of Sept. 11th, 1865, by a horse kicking him with its full force over the anterior edge of the bone about its middle. He was at once taken to the infirmary, where Mr. Miller the house-surgeon in charge, found a wound measuring about an inch by a quarter of an inch, from which blood was welling profusely.

He put up the fracture in pasteboard splints, leaving the wound exposed between their anterior edges, and dressing it with a piece of lint dipped in carbolic acid, large enough to overlap the sound skin about a quarter of an inch in every direction. In the evening he changed the lint for another piece, also dipped in carbolic acid, and covered this with oiled paper.* I saw the patient the next day, and advised the daily application of a bit of lint soaked in carbolic acid over the oiled paper; and this was done for five days. On the second day there was an oozing of red fluid from the dressing, but by the third day this had ceased entirely. On

* A cheap substitute for oiled silk, devised by the late Dr. M'Ghee, of the Glasgow very useful for covering poultices, &c.

day, when, under ordinary circumstances, suppuration would have made its appearance, the skin had a nearly natural aspect, and there was no increase of swelling, while the uneasiness he had previously felt was almost entirely absent. His pulse was 64, and his appetite improving. On the seventh day, though his general condition was all that could be wished, he complained again of some uneasiness, and the skin about the still adherent crust of blood, carbolic acid and lint, was found to be vesicated, apparently in consequence of the irritation of the carbolic acid. From the seventh day the crust was left untouched till the eleventh day, when I removed it, disclosing a concave surface destitute of granulations, and free from suppuration. Water dressing was now applied, and by the sixteenth day the entire sore, with the exception of one small spot where the bone was bare, presented a healthy granulating aspect, the formation of pus being limited to the surface of the granulations.

I now had occasion to leave Glasgow for some weeks, and did so feeling that the cure was assured. On my return, however, I was deeply mortified to learn that hospital gangrene attacked the sore soon after I went away, and made such havoc that amputation became necessary.

While I could not but feel that this case, by its unfortunate issue, might lose much of its value in the minds of others, yet to myself it was perfectly conclusive of the efficacy of carbolic acid for the object in view. At the same time it suggested some improvement in matters of detail. It showed that the acid may give rise to a serous exudation apt to irritate by its accumulation, and therefore that a warm and moist application would be advantageous to soothe the part, and also ensure the free exit of such exuded fluid. At the same time it appeared desirable to protect the crust with something that would retain the volatile organic acid more effectually than oiled silk or gutta percha, through which it makes a way with the utmost facility. For this purpose a metallic covering naturally suggested itself, and as ordinary tinfoil is unsuitable from its porosity, I employed thin sheet-lead, and afterwards block tin, such as is used for covering the jars of anatomical preparations, superior to lead on account of the facility with which it can be moulded to any shape that is desired.

At length a case presented itself well calculated to test the value of carbolic acid in compound fracture.

Case 3.—John H., aged 21, a moulder in an iron foundry, was admitted on May 19th, 1866, with compound fracture of the left leg, produced in the following manner. He was superintending the raising by crane of an iron box containing sand ready for a casting, the box and its contents weighing about 12 cwt., when one of the chains by which it was suspended slipped, and the box fell from the height of four feet with unbroken force upon the inner side of his leg, which was planted obliquely beneath it. Both bones were fractured, the tibia about its middle, and a wound an inch and a half in length, and three-quarters of an inch broad, was made at the inner aspect of the limb, on a level with the fracture of the tibia, and obviously communicating with it. At the same time the soft parts generally were much contused, as was evident from the great distension of the limb with extravasated blood. Dr. A. Cameron, my house-surgeon, finding, on manipulating the limb, that bubbles escaped along with the blood, implying that air had been introduced during the movements of the leg as the patient was being carried to the infirmary, thought it best that I should see the case, which I did at three p. m., three hours and a half after the accident. In order to expel the air I squeezed out as much as I could of the clotted and fluid blood which lay accumulated beneath the skin, and then applied a bit of lint, dipped in carbolic acid, slightly larger than the wound, and over this a piece of sheet tin about four inches square. Finally the limb was placed in pasteboard splints, resting on its outer side with the knee bent. At eight p. m. some more acid was added with another piece of lint, so that the crust of clots, carbolic acid and lint, was about one-third of an inch in thickness. A hot fomentation also was applied over the inner aspect of the leg, the crust being protected by the tin. Next day he was pretty easy, and had passed a quiet night, though

occasionally awakened by starting pains; the pulse was 90, but he took some food with relish. The surface of the crust was touched again with carbolic acid, and the fomentation was continued, and in place of the internal pasteboard splint, a large sheet of tin was applied over the flannel, from the knee to the ankle, being retained in position by looped bandages. This proved a very satisfactory arrangement, the tin having sufficient firmness to answer the purpose of a splint, while it most effectually retained the moisture of the flannel, which, again, served as an excellent padding. The fomentation was changed night and morning, and gave great comfort to the patient, and once a day carbolic acid was applied lightly to the crust.

Two days after the accident the limb was easier, but the circumferential measurement of the calf continued the same, and the pulse was 96, though soft. On the fourth day—the critical period with reference to suppuration—the limb was free from pain, and the calf less tense, and distinctly reduced in dimensions; while the pulse had fallen to 80, and the patient had enjoyed his food after a good night's rest. After this the swelling steadily subsided, the skin remaining, as it had been from the first, free from the slightest inflammatory blush, and his general health was in all respects satisfactory. Seven days after the receipt of the injury there was some puriform discharge from the surface of the skin where the carbolic acid, confined by the smaller piece of tin that covered the crust, had produced excoriation by its caustic action; and to prevent needless irritation from this cause, the tin was reduced so as to leave only a narrow flat rim round a bulging part, which corresponded to the crust.

About a fortnight after the accident a sense of fluctuation was experienced over the seat of fracture, but, as all was going on favourably otherwise, I hoped that this was due simply to serum from the effused blood; and in a few days it had completely disappeared, not a drop of pus meanwhile having escaped from beneath the crust. About this time the edges of the crust became softened by the superficial discharge from the surrounding parts, and these softened portions were daily clipped away with scissors. Thus the circumferential part of the crust which had overlapped the skin was removed, and that which lay over the extravasated blood in the wound was also reduced to smaller and smaller size.

On the 7th of June, nearly three weeks after the accident, an observation of much interest was made. I was detaching a portion of the adherent crust from the surface of the vascular structure into which the extravasated blood beneath had been converted by the process of organisation, when I exposed a little spherical cavity about as big as a pea, containing brown serum, forming a sort of pocket in the living tissues, which, when scraped with the edge of a knife, bled even at the very margin of the cavity. This appearance showed that the deeper portions of the crust itself had been converted into living tissue. For cavities formed during the process of aggregation, like those with clear liquid contents in a Gruyére cheese, occur in the grumous mass which results from the action of carbolic acid upon blood; and that which I had exposed had evidently been one of these, though its walls were now alive and vascular. Thus the blood which had been acted upon by carbolic acid, though greatly altered in physical characters, and doubtless chemically also, had not been rendered unsuitable for serving as pabulum for the growing elements of new tissue in its vicinity. The knowledge of this fact is of importance; as it shows that, should circumstances appear to demand it, we may introduce carbolic acid deeply among the blood extravasated in a limb, confident that all will nevertheless be removed by absorption. A few days later all traces of the little cavity had become obliterated by the granulating process.

At the close of the third week the application of carbolic acid to the crust was discontinued, and the original internal pasteboard splint padded with cotton was again employed, instead of the tin and fomentation. What remained of the crust was still kept protected with the tin cap, with the view of ascertaining how long it would continue to adhere; and at length, nearly four weeks after the accident, I tore it off from the vascular surface beneath,

which bled as I did so. The crust had preserved the subjacent parts from disturbance as effectually as if it had been a piece of living integument; and it is worthy of remark that the vascular surface below had not the pulpy softness of granulations, but was comparatively firm and substantial. The bit of crust still smelt of carbolic acid, though none had been applied for five days.

At the expiration of six weeks from the receipt of the injury the fragments were found firmly united in good position, just as if the fracture had been a simple one, though the cicatrisation of the rather extensive sore was not complete till a later period.

Case 4.—James W., aged 10, was engaged in a turner's factory worked by steam power on the 8th of June, 1866, when his right arm was drawn in between a strap and a shaft turned by it. He called out for assistance, but thinks two minutes must have elapsed before the machinery was stopped, and during the whole of this time the strap, which was still moving while he held the arm steady, was cuting into the ulnar side of the forearm, breaking through the ulna about its middle, while the radius was bent with "green-stick" fracture. He was taken at once to the infirmary, where the wound was found to be about an inch and a half in depth, occupying more than half the circumference of the limb, chiefly at the dorsal aspect, but extending round also to the palmar side. The upper fragment of the ulna was protruding about an inch, and two strips of muscle, about a quarter of an inch in thickness and from two to three inches in length, were hanging out; the lacerated state of the parts confirming the boy's account of the accident.

On seeing him about two hours afterwards, I sawed off the protruding portion of the ulna, and the tags of muscle having been previously clipped away, I applied carbolic acid freely to the whole interior of the wound, including the exposed surface of the bone; and having straightened the radius, which gave way during the process, placed the limb upon a wooden palmar splint. Avoiding any attempt to approximate the lips of the wound, I covered it with a piece of sheet-tin, sufficiently large to overlap the sound skin about a quarter of an inch in every direction. The limb was fixed to the splint by a bandage, so arranged as to permit the removal of the tin without disturbing the apparatus; and hot fomentations were applied over the whole. A few minutes after the carbolic acid was applied he said he was perfectly easy. At seven o'clock he asked for food, and took it. His pulse was then 84. At eight p. m. I saw him again, and applied beneath the tin a piece of lint dipped in carbolic acid, about as large as the wound. Noticing some distortion in the upper arm, I found that the humerus also was broken in its lower third, and applied splints accordingly, the limb being kept supported upon a pillow beside him. He slept a good deal during the night, though moaning and starting occasionally. Next day his pulse was 108; but he took his breakfast heartily, and the tongue was healthy, while he complained only of a little uneasiness about the elbow, and even this disappeared on changing the fomentation cloth. A piece of sheet-tin was now arranged so as to form a sort of cover for the forearm, including the hand. Being retained in position by looped bandages, it increased the steadiness of the limb, while it ensured efficiency of the fomentation.

Two days after the accident the oozing of blood and serum, which had been considerable during the previous twenty-four hours, had nearly ceased; but he still experienced comfort from the fomentation, though any pain which he felt was connected with the simple fracture of the humerus. His pulse was 88; his tongue clean and appetite good after a sound sleep at night; and from this time onward his general health continued perfectly satisfactory. On the fourth day a small quantity of pale, grey, slimy discharge, was observed from beneath the crust at one part; and thinking that this might, perhaps, have occurred for want of proper action of the carbolic acid, I applied the latter with unusual freedom to the surface of the crust. This was repeated at night; and the same energetic use of the carbolic acid, twice in the twenty-four hours, was continued on the fifth day. Yet, on the sixth day, the discharge from beneath the crust, instead of being diminished, was increased, and more puriform to the naked eye; while, under the microscope,

there was clear indication of new cell-formation, whereas, on the day before, nothing but fibrinous material, with granular and other débris, had been discoverable. On the seventh day the discharge was still greater in amount; yet the limb remained free from pain, and was steadily diminishing in circumference, and pressure in the neighbourhood of the crust failed to induce any increase of the discharge, which appeared to be merely superficial.

In the course of the next few days it became apparent that this discharge, so far from being the result of insufficient action of the carbolic acid, was caused by the stimulating influence of the acid itself, applied with greater freedom over a crust much thinner than that of Case 3. Suppuration from this cause is, however, productive of no mischief, as will be better understood from the sequel. That such was the case in this instance was manifest on the fourteenth day, when the crust, which was nearly detached, was removed, disclosing an appearance for which I confess I had not been prepared. In place of the deep ragged wound was a granulating sore, nearly on a level with the skin, and pretty uniform in surface, except at one part about its middle, where there was a depression about half an inch in depth, at the bottom of which a small portion of the outer surface of the ulna was visible, bare, but of pink colour. Not only had the compound of blood and carbolic acid which had existed in the depths of the wound been organised, but the portions of tissue killed by the violence to which they had been subjected in the accident, and also those destroyed by the caustic action of the carbolic acid, had been similarly acted on, and all had been, so to speak, fused together into a living mass, without the occurrence of any deep-seated suppuration.

By the nineteenth day the exposed part of the bone was covered, and the depression in the sore obliterated by granulation, without any exfoliation occurring; and two days short of seven weeks after the accident the sore was entirely healed.

The extensive loss both of bone and of the soft parts made osseous union of the ulna a matter of difficulty, and on the 5th of August the limb was placed in a starched apparatus, to promote complete consolidation, and he was soon after discharged from the hospital.

About six weeks later he presented himself at the infirmary, and the bandage was removed in my absence, when, the bone appearing firm, he was allowed to dispense with the apparatus, and was unfortunately not directed to show himself again. In the course of a few weeks, however, he appeared with the fragments again movable. The starched bandage was therefore reapplied, but when I last saw him, some weeks ago, bony union had not yet occurred. A good deal of osseous formation had, however, taken place, so that the fragments now overlapped each other; and should the cure be still incomplete when he next shows himself the case will be a fair subject for Bickersteth's method of treating ununited fracture by drilling. Meanwhile, the radius being firm, and the injured extensors of the fingers having completely regained their powers, he will, in any event, have a very useful hand.

This case indicated a greater range of applicability of the treatment by carbolic acid than I had anticipated, and encouraged me to employ it under the almost desperate circumstances of the following case:—

Case 5.—Charles F., a fine, intelligent boy, seven years of age, was knocked down at eight p.m. on June 23rd, 1866, by an omnibus crowded with passengers inside and out, and one if not both wheels passed over his right leg, breaking both the bones and inflicting a frightfully extensive wound. The person who brought him to the infirmary said that he had lost a great deal of blood, and the presence of a compress in the ham, placed there by the medical man who saw him at the time of the accident, corroborated this statement. When I saw the child, after an unavoidable delay of three hours, he was greatly prostrated by shock as well as hemorrhage, so much so that amputation appeared likely to afford but a slender chance of life, although the state of the injured parts seemed at first sight to admit of no alternative. The tibia, which was broken about its middle, lay exposed in a wound occupying almost the entire length and breadth of the inner aspect of the leg, reaching from

the inner condyle of the femur to within an inch and a quarter of the tip of the internal malleolus; the skin having been stripped back so as to lay bare the gastrocnemius as well as the bone. The large flap of integument was perforated about two inches from its edge opposite to the seat of fracture, and there was also an opening in the skin on the outer side of the leg, implying that the violence had acted with full effect upon the whole thickness of the limb. Yet the bone was not comminuted, and the muscles, though evidently severely contused, were not much lacerated, while the anterior tibial artery was felt beating in the foot; and, hopeless as would have been the idea of trying to save the limb by ordinary treatment, I determined to make the attempt by the help of carbolic acid.

Chloroform having been administered, the acid of full strength was applied with great freedom. the contused mass being repeatedly squeezed, to induce the liquid to insinuate itself into all its interstices. including that between the riding fragments of the tibia. The flap of skin was then brought towards its natural position, and lint soaked in the acid was placed upon the wide raw surface which still remained exposed, and over the lint a piece of sheet-tin. The other openings in the integument were similarly treated; and, the riding of the fragments having been corrected by extension, the limb was laid on its outer side, with the knee bent, upon an external pasteboard splint, moulded to the leg and foot, and strengthened by a temporary wooden splint. A porous cloth was applied over the tin to absorb the blood and serum which must escape from beneath its edges; and the whole apparatus was secured with a roller. At the conclusion of the dressing the pulse was 112.

He passed a restless night, though occasionally dozing, and the pulse next morning was 120. The bandage having been cut away sufficiently to enable the tin to be removed, the wound was found to have gaped so that the lint no longer covered the whole of it. Pieces of the cloth, which had become soaked with the exuded blood, were placed upon the exposed part, and also over the lint so as to make the crust more substantial, and the whole was freely treated with carbolic acid. The tin was then bulged out so as to be accommodated to the thickened crust, while overlapping the neighbouring skin to a slight extent; being retained in position by a couple of turns of bandage. A hot fomentation was then placed upon the inner aspect of the limb, and the whole leg enveloped in a large sheet of block-tin secured by looped bandages.

In the evening the pulse was 136, and on the following morning, thirty-six hours after the accident, it had risen to 168, and was very weak. He lay talking to himself in a rambling manner, unable to understand what was said to him. He was extremely restless, and had taken no food whatever since his admission. During the next night, however, he became composed, and took a little milk; and on the morning of the third day he was found to be again intelligent, while the pulse had fallen to 140, and was of fair strength. The skin in the vicinity of the injury, both at the knee and ankle, was free from discoloration or swelling; but part of the large flap of skin over the calf was of purple tint, and had evidently lost its vitality. This dead part was touched with carbolic acid, to preserve it from decomposition. and convert it into a crust for the protection of the subjacent texture, and an additional piece of tin was applied to cover it. A good deal of brown transparent fluid escaped from beneath the crust.

On the fourth day the pulse was 120; he was quite bright and tranquil, and said he felt no pain. There was still no odour about the injured part, except that of carbolic acid. The discharge was much diminished, and was principally serous.

By the sixth day the pulse was as low as 108. He had a hearty appetite, and also took with avidity the six ounces of port wine allowed him during the twenty-four hours. His tongue, which had previously been dry, was moist. He had slept well at night, though waking occasionally with a scream. The discharge from beneath the crust, trifling in amount, was chiefly serous.

On the eighth day the splint was removed for the first time, and was covered with sheet-tin in order to prevent the discharge from softening the

pasteboard. The leg had become slightly bent inwards through the yielding of the splint; and when it was now straightened, the upper margin of the crust became detached, exposing a deep granulating cavity. A bit of lint, dipped in carbolic acid, was applied lightly over this opening, and the tin was readjusted so as to cover it. Pressure in the neighbourhood of the injured part, about the knee, ankle, and calf, failed to induce the slightest increase of the discharge, which was thus shown to come merely from the surface beneath the crust, and was still for the most part transparent.

At the close of the second week his state was on the whole very favourable. His general health was much improved; and although he still suffered occasionally, especially at night, from restless movements of the limb, these had been much restrained by a new splint, extending from half way up the thigh to the toes. The wound was certainly very large, measuring eight inches in length by six in greatest width; but it was healing round almost the entire circumference. In order to permit cicatrisation, which carbolic acid tends to check, the detached edges of the crust had been clipped away, and the exposed narrow ring of granulations was dressed with lint dipped in a solution of sulphite of potash—five grains to an ounce of water. The crust, however, was still touched daily as before with carbolic acid, while the tin still covered the whole of the injured part. By this means it was intended that cicatrisation should be allowed to go on, and yet decomposition of the discharge be prevented; and this seemed to be to a great extent, if not entirely, attained.

There was, however, one unfavourable circumstance. The little sore on the outer side of the leg, which had been dressed separately without carbolic acid, and had for some time been observed to be increasing rather than diminishing, now assumed unmistakably the appearance of a mild form of hospital gangrene, and became blended with the main sore. For two days an attempt was made to correct the disease by touching the affected part with nitric acid; but on the eighteenth day it was clear that some more effectual measures must be adopted, as the skin in the vicinity had become insidiously undermined to a very serious extent. Accordingly I placed the boy under chloroform, and scraped away with a spoon all the soft grey sloughs, slitting up the skin in order to gain access to them, and in some parts clipping portions of it away, and then applied the strongest nitric acid thoroughly to the bleeding surface. As the disease extended up to the anterior edge of the crust, I thought it right to examine the state of the parts beneath, and as it was pretty loose I removed it. And now a sight presented itself which filled me with horror. There was, indeed, no appearance of hospital gangrene in the parts which the crust had covered, the granulations there having the florid aspect of perfect health; but in the large sore lay the lower fragment of the tibia, freely exposed to the extent of two inches and a half in length, bare and white like a macerated bone. At the upper end of this fragment, and apparently for a considerable distance from it, the bone was thus denuded round its entire circumference; and judging from previous experience, there was reason to expect that, even if the patient should survive the profuse suppuration which was to be anticipated, about two inches of the whole thickness of the tibia must exfoliate, an amount of loss which, in the child's small limb, would of necessity render it utterly useless. The upper fragment was also bare for about half an inch just above its extremity, but the end itself was covered with prominent granulations.

Though despairing of any good result, I resolved to watch for a while the progress of events, prepared to amputate as soon as the boy's health should show signs of failing; and comforting myself with the reflection that he had been brought into a state greatly more favourable for the operation than on his admission. In order to keep down the amount of the discharge the sore was dressed with the sulphite of potash lotion, a poultice being applied to the part which had been treated with nitric acid. When the sloughs caused by the caustic separated a healthy surface appeared, which in the course of the next ten days was nearly healed. In other parts of the sore, however, grey patches occasionally showed themselves, assuming healthy characters after being touched with carbolic acid, which, when efficient, has the advantage

over other caustics of being painless. But at length spots of hospital gangrene appeared in a form no longer amenable to this mild treatment, in spite of which they began to extend rapidly, and on the 26th of July it became necessary to put the child again under chloroform and apply nitric acid in the same thorough manner as before. This had the effect of producing a perfectly healthy state of the whole sore, which proceeded to heal with great rapidity; so that by the 8th of August it was found to measure an inch less in length and two inches less in greatest breadth than at the time when the crust was removed.

In the meantime his general health, instead of deteriorating, had improved, and he was evidently regaining flesh, while the discharge of pus was astonishingly little considering the state of the limb, being barely sufficient to soak the single layer of lint that covered the sore.

The explanation of this satisfactory state of things was afforded by an observation of much interest made at this period. Since the removal of the crust the granulations had been growing up on all sides about the bone, so that the bare part of the upper fragment was almost entirely covered in, and even the lower fragment, which projected beyond the level of the upper, was to a great extent embedded in the new growth. It had been noticed before the end of this fragment was so much covered up, that granulations were sprouting from the medullary canal, showing that the bone was not dead in its entire thickness. Nevertheless, as the superficial parts had certainly lost their vitality, I had not doubted that a thin layer at least must exfoliate from the whole. Now, however, I observed that some of the surface which remained exposed had assumed a pink colour, implying that the layer of dead bone, whatever its thickness might have originally been, had become so thin as to be transparent, through absorption by new tissue growing in the interior. Further, on attempting to pass the eyed end of a probe between the tibia and the granulations which had enveloped it, I found to my surprise that the instrument could only be introduced for a very short distance, the granulations, with the exception of a narrow free border, being everywhere adherent. The new tissue outside the bone had coalesced with that within, after complete absorption of the intervening dead stratum. Hence the remarkable absence of discharge from around the bone.

During the following month I was absent from home, but was informed that the same process was for some time continued: the granulations gradually encroaching more and more on the exposed bone, and adhering to it as they advanced. The upper fragment was thus entirely covered without any exfoliation occurring, and the bare surface of the lower fragment was reduced to comparatively small dimensions. On the 10th of September the remainder of the dead part, being loose, was removed without difficulty as an exfoliation. It was about an inch in greatest length; but was of extremely irregular shape, full a quarter of the circumference of the tibia being deficient. At the upper end, where it had been most prominent and had become discoloured, it had nearly the full thickness of the dense tissue; but towards the lower end it became thinned away, so as to be in some places as delicate as tissue-paper. The outer surface presented near the margin an appearance of especial interest, being at some parts, even where the bone had considerable thickness, variously scooped and bevelled in a manner that admitted of no other explanation than that the granulations overlapping the dead bone externally had been engaged in its absorption. On applying a magnifier to these excavations in the external surface, they were seen to present a peculiar velvety aspect, differing from the rest of the exterior, but resembling the internal parts of the exfoliation.

The only observation at all analogous to this with which I am acquainted is that of the effects produced upon the ivory pegs used in Dieffenbach's method of treating ununited fracture, the parts of the pegs driven into the bone having been observed, when removed, to have suffered diminution in size. This has hitherto remained as an isolated fact, and it has been regarded as an axiom in surgery that a piece of bone once dead must all come away as an exfoliation. Why it was that in the case before us, the osseous tissue

destroyed by external violence, aided by the action of carbolic acid, was so exceptionally affected by surrounding parts, the granulations in its vicinity discharging the office of absorbents of the dense tissue, instead of forming pus like those around an ordinary exfoliation, I will reserve for future discussion, when I shall have occasion to point out the great importance of the fact in its bearing both on pathology and practice. Meanwhile I may remark that it illustrates beautifully the function of absorption, which, even where solid substances are taken up, does not require any special set of absorbent vessels, but may be effected even by granulations, the most rudimentary of all tissues, each cell feeding upon any suitable substance in its vicinity.

We also see at once the value of the observation with reference to the treatment of compound fracture with carbolic acid; for it shows that in cases in which the bone is exposed, the acid may be applied so freely as to cause death of its tissue without necessarily inducing exfoliation.

The case was now reduced to one of simple fracture with a large granulating sore, and this was greatly diminished and healing rapidly while the union of the fragments was becoming very firm; and the limb would doubtless soon have been entirely sound had it not been for that cruel scourge, hospital gangrene. This, however, had shown itself ten days before the removal of the exfoliation, not in the sore, but about an inch from its edge, as a pustule in the cicatrix, which on bursting disclosed a grey slough, that soon showed its characters unmistakably, producing considerable destruction of the scar, although the original sore continued to heal kindly.

I will not enter into the history of this and numerous subsequent attacks of the disease, further than to state that they were partial in their effect, the unaffected parts still healing with rapidity, and that they continued to yield to the treatment with nitric acid; so that at one time the whole sore was very nearly healed.

But in the early part of October the disease assumed a more intractable form, and in spite of the most energetic use of nitric acid on several occasions, which produced illusory appearances of temporary improvement, by the 27th of the month the sore had become enlarged to nearly its original dimensions, while the limb had swollen greatly through inflammation caused by the irritation, and the boy's general health was rapidly giving way under the increased discharge and nervous excitement.

The question of amputation now again presented itself, but a good airy room in a different department of the hospital being happily now at my disposal, I determined to give the limb one last chance. Before he was taken to the new ward, nitric acid was once more thoroughly applied. His nurse was directed to change the poultice every three hours, and he continued to take wine and some tonic medicine. His general health immediately improved, and when the slough separated, the sore looked healthy. It was now dressed with lint dipped in a solution of sulphate of copper, five grains to an ounce of water, and over this a poultice, the whole being changed every three or four hours night and day; and under this treatment cicatrisation proceeded rapidly. Yet when the scar had attained a certain width, a tendency to vesication again showed itself, threatening recurrence of the disease, and in order to prevent the newly-formed epidermis from acquiring poisonous qualities as it seemed to do, I ordered the lint with the lotion, as well as the poultice, to be extended over the whole cicatrix. From the time this dressing was adopted the progress was uninterruptedly satisfactory till the 9th of January, when the sore was at length entirely healed, and he was allowed for the first time to put his foot to the ground. The contraction of the large cicatrix, involving at one part the gastrocnemius muscle, had caused some bending of the knee and pointing of the toes. The former has since become corrected spontaneously by his habitual attitude, sitting in bed with the legs extended before him. The pointing of the toes has also become diminished, and will probably soon pass off entirely, without the division of the tendo Achillis, which I had in view. The tibia, which has long been firm, is of precisely the same length as the other, and the contour of the limb is natural. His general health also is excellent; but he was detained in the hos-

pital till the 9th inst. (March, 1867), on account of an obstinate eczematous eruption on the integument of the leg irritated by the long-continued poulticing.

Case 6.—The following case terminated fatally, but from circumstances of an accidental nature; and I trust that the instruction to be derived from it will not be interfered with by the unhappy ultimate result.

John C., aged 57, a labourer, was working in a quarry at Row, near Helensburgh, on the Clyde, at nine a. m. on Oct. 26th, 1866, when, striking with a crowbar an overhanging part, he brought down an enormous mass of stone weighing six or seven tons, which fell in large blocks on and about him. His right thigh-bone was broken in its lower third, and, as afterwards appeared, the end of the upper fragment was driven through the skin at the inner aspect of the limb a little above the knee. The right collar-bone was fractured at the same time, and he was severely contused in other parts. It was long before his only companion in the quarry could extricate him from his position, and the procuring of a conveyance involved further delay; so that a considerable period elapsed, during which he lost much blood from the thigh, before he could be taken to Helensburgh. Here he was placed on a litter, with a warm moist blanket round the limb, with the object, as he said, of checking the bleeding, which, however, it could not but tend to encourage. He was then conveyed by train to Glasgow, where he reached the infirmary six hours after the occurrence of the accident.

Dr. Archibald Cameron, the house-surgeon, seeing the case to be a very grave one, at once sent for me, but without any delay introduced carbolic acid into the wound by means of a piece of lint held in a pair of dressing forceps, passing it about an inch in every direction beneath the integument, after squeezing out a considerable quantity of extravasated blood from the orifice, which was large enough to admit the tip of the finger.

On arriving, an hour after the patient's admission, I found him in a state of prostration sufficiently explained by the severity of his injuries and by the blood lost to the circulation, including a large amount extravasated in the limb, and distending not only the whole thigh, but the calf, the tenseness of which contrasted strikingly with the flaccidity of the other.

Under these circumstances decomposition of the blood effused among the tissues would have been necessarily fatal. And yet, considering the length of time that had elapsed since the receipt of the injury, and the fact that a reeking flannel had been for two hours in contact with the wound, and had already a somewhat offensive odour when removed from it, there seemed but a poor chance for the treatment with carbolic acid. On the other hand, taking into account the man's time of life and general condition, I believed that to amputate through the thigh infiltrated with blood would be certainly to kill him. And therefore, as it was impossible to say that the other treatment had no chance, while, if it should prove successful, it would have the immeasurable superiority of saving limb as well as life, I determined to persevere with it.

Having removed from the wound the dressings placed on it by Dr. Cameron, I forcibly squeezed out a further large amount of blood, and applied carbolic acid in lint and also mixed with blood, so as to provide for a crust of considerable thickness overlapping the skin by about half an inch every way. This was covered with a circular piece of tin, two inches across, well bulged out except a flat margin about a quarter of an inch wide, which rested on the surrounding integument. This tin cap was retained in position by a single turn of bandage tied round the limb.

The lower end of the upper fragment was much displaced downwards in the vicinity of the wound, but returned towards its natural position on extension of the limb. There still remained considerable depression anteriorly over the seat of fracture; but the lower fragment did not seem to project towards the ham so much as to forbid the use of the long splint. This I accordingly employed with two interior splints to support the muscles of the thigh, one of Gooch's material on the outer aspect, the other a large sheet of stout block-tin, embracing the anterior, inner, and posterior aspects of the limb to a little

below the knee, padded in the first instance with a dry towel, for which a hot fomentation should be substituted when all tendency to hemorrhage should have ceased. The object of having the tin extend round the back of the thigh was that it might prevent the discharges from soaking into the bed beneath; and in this way it proved extremely useful.

He passed an uneasy though not entirely sleepless night, suffering more from his shoulder and bruised side than from the thigh. Next morning his aspect was favourable, the pulse 76, and tongue natural; he took a little tea for his breakfast, but nothing solid. The tin cap having been removed, care being taken to avoid detaching the crust along with it, carbolic acid was applied to the surface of the latter. A hot fomentation cloth was then placed on the inner side and front of the thigh, and gave him great comfort, and when the dressing was completed he was quite easy. The interior splints being kept in position by looped bandages, and the long splint by the usual folded sheet fixed by pins, along with the perineal band and handkerchief round the foot, the fomentations could be changed night and morning without any disturbance of the limb.

The following night he had a good deal of sleep, the thigh not causing him any inconvenience; and next day, the third after the accident, he took solid food with relish. His pulse was 72, and his tongue continued moist, though he was somewhat thirsty. The crust was touched again with carbolic acid, and covered with a circular piece of calico to prevent the tin cap from adhering to it. He still found comfort in the fomentations.

On the fourth day he made a substantial breakfast after a good night's rest, and was not so thirsty. There was, however, now seen for the first time a slight blush of redness on the front of the thigh over the seat of injury. This was on the fifth day somewhat increased, and the thigh and calf were both more swollen. The tongue also was slightly furred at the base, and his appetite was not quite so good.

On the sixth day the dimensions and appearance of the limb were unaltered, but on the seventh both the redness and swelling were distinctly diminished.

By the end of the second week his appetite was improved and his pulse was 76; while there had not been a drop of discharge from beneath the crust, which had been still touched daily with carbolic acid, the fomentations also having been continued. The swelling, however, had not subsided, and the redness, though varying in extent and degree, had never disappeared from over the seat of fracture. On the fifteenth day a defined prominence made its appearance at this part in a space about as large as the palm of the hand, a little further forward than the crust, and a sense of fluctuation was to be perceived in it. In the evening Dr. Cameron, on changing the fomentation, saw more pus than he thought could be accounted for by the superficial excoriation round the crust, and next morning, on removing the flannel, I found it soaked with similar discharge; a considerable quantity also lying between the tin splint and the limb. On raising the tin cap, the matter was seen welling out from beneath the lower edge of the crust. It was perfectly free from odour, confirming the conclusion I had previously arrived at that this abscess was not in any way caused by decomposition from atmospheric influence. The long period that elapsed before it made its appearance, together with the absence of any serious constitutional disturbance, clearly showed that the carbolic acid had effectually answered the purpose for which it was applied, the constant oozing of blood from the small wound having doubtless been in the patient's favour, by preventing decomposition from penetrating far into the interior before he came under treatment. We know that a mass of extravasated blood occasionally becomes the seat of suppuration without the existence of any external wound. A curious instance of this occurred lately in my practice, in a boy who fell down the hold of a ship upon his head, and, besides serious cerebral symptoms, exhibited at once a remarkable prominence of the right eyeball, evidently due to extravasation of blood into the orbit. There being no wound, I expected that the blood would be absorbed; but after the lapse of several days, the prominence of the eye showed increase rather than diminution, and the boy began to com-

plain of supraorbital pain. Fluctuation then became perceptible, and pus was evacuated by incision, after which the eyeball gradually resumed its natural position.

Such I supposed to be the nature of the abscess in C.'s case, and previous experience made me fear that, if decomposition of its contents should occur, the irritation of the fetid pus might cause very serious consequences from rapid extension of suppuration among the imperfect and feeble products of the organization of the blood in the yet swollen limb.

Hence I had intended to evacuate the matter by aid of carbolic acid in such a way as to prevent decomposition. As the abscess was not near the surface at the part where it appeared to be pointing, I reckoned on having plenty of time for my operations, and was greatly disappointed to find that it had discharged itself spontaneously.

Nevertheless, as the pus was proceeding from beneath the crust impregnated with carbolic acid, and was still quite odourless, I did not altogether despair of attaining my object. In order to make the crust more effectual, I extended it for about three-quarters of an inch at the part from which the pus was escaping, by a piece of lint dipped in carbolic acid, which, when mixed with pus, forms a sort of curdy mass which answered pretty well for a crust. A considerable quantity of matter, of moderate consistence and greenish white colour, was then pressed out from the limb. A new tin cap having been made, large enough to cover the whole of the extended crust, the fomentation was continued as usual.

Next day it was evident, from the sense of fluctuation, that reaccumulation had occurred in the abscess, but no further discharge had taken place. On removing the tin cap, however, pus was seen to well out from a new situation at the upper edge of the crust. A piece of lint dipped in carbolic acid was at once placed on this part, and the matter was pressed out and carefully collected, measuring 3oz., of moderate consistence and yellowish white colour, still without odour except that of carbolic acid. The crust having been somewhat extended at the situation of the new opening, the whole was freely treated with carbolic acid, the tin cap readjusted, and fomentation continued.

During the rest of the week that followed the first evacuation of the abscess the same treatment was pursued with the most satisfactory results. Some pus was usually seen on the fomenting flannel both morning and evening, and some was pressed out of the limb from the orifice last formed, but the amount rapidly diminished in quantity, and also became thinner and more transparent, while it continued free from odour. It may be worth while to mention in detail the quantities obtained from the limb in the morning of each of these days. On the seventeenth day it was an ounce and a half, somewhat thinner than before; on the eighteenth, two drachms and a half, decidedly thinner; on the nineteenth, half a drachm, much thinner and more transparent; on the twentieth, a quarter of a drachm, similar in quality; and on the twenty-first, six drops only, and almost free from opacity. Finally, in the evening of that day no discharge was seen on the flannel, nor could any be squeezed out from the limb. Meanwhile, the calf, which had increased markedly in circumference just before the abscess opened, steadily diminished, and in the thigh all swelling disappeared from over the seat of fracture, so that the end of the upper fragment, previously quite obscured, could be distinctly defined. His general health, too, had improved; his tongue had become quite clean, and he had acquired for the first time since his admission a genuine appetite, the pulse continuing about 72.

I suspect, however, that this success made us relax a little our vigilant care in guarding against decomposition. But be this as it may, the method which we pursued in order to avoid it was not, as experience as since shown, thoroughly trustworthy. Would that I had at that time known of the mode of proceeding which will be found described in a future section of this communication. Very different then might have been the issue of the case!

On the twenty-second day pus was again found in the flannel, and some

bubbles of gas were observed to escape along with the two or three drops that could be squeezed from the limb, and these had a distinctly offensive odour. Judging it now useless to retain the crust any longer I removed it, and found the original wound still sealed by the original clot, the openings by which the pus had escaped being new apertures in the skin overlapped by the crust. In the after part of the day he had a good deal of uneasiness, and in the evening half an ounce of pus, with numerous air-bubbles, was pressed out of the limb by Dr. Cameron. After this the patient passed a comfortable night, and in the morning only two drachms of matter could be procured from the thigh, but this was thicker and more opaque than it had been, with decidedly offensive odour, and contained bubbles of gas; there was also pus in the flannel. There was, further, some return of swelling over the seat of fracture.

But though the plan of dealing with the abscess had failed to accomplish all that I desired, its essential object appeared to have been attained. For during the week in which decomposition was prevented, the thigh had become so much consolidated and strengthened that all danger of serious consequences seemed to have been tided over. No extension of the suppuration took place beyond the trifling degree above described, and his constitution did not suffer. Any further use of carbolic acid being obviously uncalled for, the sore was simply dressed with a lotion, the lint being so arranged as to allow free escape for the pus, and afterwards, to promote this more effectually, a small perforated caoutchouc tube was introduced, a dry cloth being substituted for the fomentation. Under this management the discharge gradually diminished in quantity, and became again thinner and more transparent, and the swelling of the calf became steadily reduced.

Still the opening did not close, and on the 2d of December, more than a fortnight having passed in this way, I introduced a probe, and found that it passed downwards to bare bone, including a considerable extent of surface in the lower fragment. Here, then, was presented the prospect of a tedious process of exfoliation; whereas if decomposition of the pus had not occurred the granulations would probably have closed upon the dead bone, and absorbed it, as in the last case, and the fact that any part had lost its vitality would then never have been known. That there is a reasonable ground for this belief will, I trust, appear from the discussion in the succeeding section.

For a long time the progress of the patient continued satisfactory, the process of union of the fragments advancing steadily, till in the early part of February, the bone being firm, the splints were entirely discarded, and the case was reduced from one of fracture to one of limited exfoliation. It was satisfactory also to find that the knee-joint continued movable, so that I confidently anticipated recovery, with a perfectly useful limb.

At this period, however, a new symptom presented itself—viz., hemorrhage from the sinus. Mr. Hector Cameron, my present house-surgeon, who saw the first appearance of bleeding, supposed it to proceed from the surface of the granulations; for it was then small in amount and ceased spontaneously. Some days later, however—viz., on the 11th of February,—a very profuse hemorrhage occurred, the blood soaking through the bed, and dropping upon the floor beneath, before it was observed, and the gentleman who was summoned to see the patient in Mr. Cameron's absence, found him pulseless. He afterwards rallied to some extent, but remained utterly prostrated, and unable to retain the slightest nourishment. As the popliteal artery could be felt beating in the lower part of the ham, I hoped that the source of the blood might be some minor branch, which might possibly close. But it afterwards appeared that a circular opening existed in the main vessel, occasioned no doubt by the pressure of an irregular projection of the lower fragment. It would be irrelevant to relate particularly the history of his yet further exhaustion by recurrent hemorrhages after delusive temporary cessations, or of my attempts to restore him by tying the popliteal artery, and making arrangements for transfusion, to which he declined to submit. He died on the 25th of February.—*Lancet, March*, 16, 23, *and* 30, 1867, *pp.* 326, 357, 387.

40.—ON AMPUTATION AT THE SHOULDER-JOINT.

By JAMES SPENCE, Esq., Surgeon to the Queen in Scotland, Professor of Surgery in the University of Edinburgh.

[It would be difficult to affirm that any operation at the shoulder-joint is absolutely new, that is, has never under any circumstances been performed before.]

The method of amputating at the shoulder-joint, however, which I am about to bring under the notice of the profession, is not one of those included amongst what are termed the methods of election or choice. These, although varied as to the modes of their performance, may, as regards their results, be reckoned as four in number—namely, 1st, the circular; 2d, the oval; 3d, the large deltoid flap; 4th, the double flap method. Of these, the first two are now so rarely practised that I need not further allude to them. The last two are those usually adopted, and they may be briefly described as follows:—

The former of the two, the large deltoid flap method, consists in cutting, either by transfixion or from without inwards, a large flap including nearly the whole of the deltoid muscle, raising it towards its scapular attachments so as to expose the joint and permit of disarticulation, and the formation of a short flap from the floor of the axilla to meet and unite with the large flap.

The double flap method consists in forming, either by transfixion or dissection, two nearly equal and slightly rounded flaps, their line of union after the completion of the operation being represented by a line drawn from the point of the acromion to the base of the axilla. This plan of operating is that generally adopted; for although the deltoid flap makes an excellent covering, and admits of great facility in disarticulation, yet the amount of exposed cut surface and the double line of cicatrix contrast unfavourably with the single central linear scar left by the double flap method. Moreover, the great length of tissue required in the deltoid flap cannot often be obtained in cases requiring amputation at the shoulder.

As regards the method by double flap, if we look at such an amputation when recently performed, especially if executed by cutting the textures from without inwards, nothing can look better than the result; the two flaps joining neatly in their central line, and sufficiently full to give roundness and to fill up the space under the acromion. But if we look at such a stump some time after the healing process has been effected, the form of the stump will be found much altered, not merely from atrophy of texture common to all stumps, but from retraction of the muscular constituents of the flaps. The fibres of the pectoralis major retracting towards the sternum, and those of the latissimus dorsi and teres major towards the scapula and spine, cause a tendency to separation, especially at the lower part of the line of union, and give rise to the formation of a deep ugly hollow under the acromion.

In 1856, from a perusal of Professor Langenbeck's and M. Baudens' memoirs on excision of the shoulder for gunshot wounds, I was induced to adopt the method of excision by a single linear incision made down upon the head and neck of the humerus, beginning immediately external to the coracoid process, instead of the V-shaped incision then practiced here. In performing the operation on the living subject, I was struck, not only by the ease with which disarticulation could thus be accomplished, but also by observing that, from the deltoid being divided so far forward, there was no trouble with bleeding from the trunk of the posterior circumflex artery, which in other methods is always divided and often proves troublesome. Ever since then I have performed excision by that method. In demonstrating the operation to my surgical class, I pointed out that it possessed another advantage—namely, that if, in proceeding to excise the head of the humerus, the injury or disease were found to be more extensive than anticipated, we could form—by simply carrying the incision back towards the posterior fold of the axilla, as I then expressed myself—a very tolerable

stump. But when, after performing the excision, I completed the demonstration by converting the excision into an amputation, it struck me that the result would be even better than that of the ordinary method. Accordingly I determined to use it on the first suitable case which I met with.

Some short time afterwards two cases of injury were sent to my care requiring amputation at the shoulder: one the result of a railway accident, shattering and tearing the upper arm; the other, a gunshot wound shattering the tuberosities and shaft. In these two cases I carried out the plan, and the result was so perfect in both that I have always since resorted to it in every instance where the nature of the case admitted of its performance. Indeed, the only instances in which I could not perform it have been two: the one a case of secondary amputation for a burn, in which, from the state of the textures, I was compelled to form the flap entirely from the front; and the other a case requiring amputation from the presence of a malignant tumour, to which the skin was adherent, and where only two very small flaps could be obtained from the sound texture.

What I have already said might almost indicate the method proposed. But to describe it more distinctly and fully. Supposing the right arm to be the subject of amputation. The arm being slightly abducted, and the head of the humerus rotated outwards, if possible, with a broad strong bistoury I begin by cutting down upon the inner aspect of the head of the humerus, immediately external to the caracoid process, and carry the incision down through the clavicular fibres of the deltoid and pectoralis major muscles till I reach the humeral attachment of the latter muscle, which I divide. I then with a gentle curve carry my incision across and fairly through the lower fibres of the deltoid towards the posterior border of the axilla, unless the textures be much torn. I next mark out the line of the lower part of the inner section by carrying an incision, through the *skin and fat only*, from the point where my straight incision terminated, across the inside of the arm to meet the incision at the outer part. This ensures accuracy in the line of union, but is not essential. If the fibres of the deltoid have been thoroughly divided in the line of incision, the flap so marked out can be easily separated (by the point of the finger without further use of the knife) from the bone and joint, along with the posterior circumflex trunk, which enters its deep surface, and drawn upwards and backwards so as to expose the head and tuberosities. The tendinous insertions of the capsular muscles, the long head of the biceps, and the capsule are next divided by cutting directly on the tuberosities and head of the bone; and the broad subscapular tendon especially, being very fully exposed by the incision, can be much more easily and completely divided than in the double flap method. By keeping the large posterior flap out of the way by a broad copper spatula or the fingers of an assistant, and taking care to keep the edge of the knife close to the bone, as in excision, the trunk of the posterior circumflex is protected. The only vessel which bleeds is the anterior circumflex divided in the first incision, and here, if necessary, a pair of catch forceps can be placed on it at once. In regard to the axillary vessels, they can either be compressed by an assistant before completing the division of the soft part on the axillary aspect, or, as I often do in cases where it is wished to avoid all risk, by a few touches of the bistoury the vessel can be exposed and can then be tied and divided between two ligatures, so as to allow it to retract before dividing the other textures.

In this, as in all amputations, I make a point of gently drawing out the large nerves and cutting them so short that they cannot become implicated in the cicatrix, but may be so deeply covered as to save them from liability to irritation from external influences. In cases where the limb is very muscular I dissect the skin and fat from the deltoid at the lower part, and then divide the muscular fibres higher up by a second incision, so as to avoid redundancy of muscular tissue. After arresting bleeding I bring the edges together with a few points of suture, leaving an opening at the lower and back part, through which the ligatures are brought out and the free escape of blood and other discharge permitted.

The dressing I use is very simple, being merely a flat pad of lint secured

by a six-tailed split cloth, the tails being tied on the opposite side of the body.

The advantages I claim for this plan are—1st. The fulness and better form of the stump left after the healing, as shown in the results. 2nd. In this the posterior circumflex artery is not divided except in its small terminal branches in front, whereas, both in the large deltoid flap and the double flap methods, the trunk of the vessel is divided in the early steps of the operation, and, retracting, often gives rise to embarrassing hemorrhage. Besides, in the case of the single flap method, the vitality of the flap must be seriously compromised, as it depends chiefly on that vessel for its arterial supply, 3rd. The great ease with which disarticulation can be accomplished.—*Lancet, Feb.* 2, 1867, *p.* 142.

41.—ON EXCISION OF THE KNEE-JOINT, AND THE EMPLOYMENT OF A NEW APPARATUS IN THE AFTER TREATMENT.

By Dr. Patrick Heron Watson, F. R. S. E., Surgeon to the Royal Infirmary, and to Chalmers's Hospital for Sick and Hurt.

[In the following paper it is only the after-treatment of excision of the knee-joint which is considered. The question of the mode of operating, and of the selection of cases is not otherwise than incidentally referred to.]

It was in such circumstances that, about two years ago, I devised the following apparatus, which I have employed in every instance since that time in which I have performed the operation of excision of the knee. Since my introduction of it to the attention of my colleagues in the Infirmary, it has, I am glad to say, met with their sanction and practical approval, having been most successfully employed by Professor Spence and Dr. Gillespie in several cases. I have also understood, from the communications of friends and former pupils, that it has received even already a wide reputation, not only at home, but even abroad, commending itself to the attention of practical surgeons chiefly on account of its simplicity, comfort, and ease of application. It consists essentially of two parts—1. A suspension-rod made of iron, about the size of No. V. of trade wire gauge; 2. A modelled Gooch splint, long enough to extend from the tuberosity of the ischium to beyond the heel.

The suspension-rod extends from the groin to the extremities of the toes, and is bent to the outline of the limb, departing from it only in the situation of the excision, where it forms a bow or arch. To the upper surface of the rod are attached one or more hooks by which the suspension is effected.

Fig. 1.

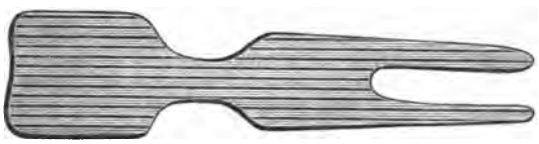
Suspension-rod for front of limb—the arch corresponds to the site of excision, the suspension-hook to the ankle-joint, upper end should terminate at the fold of the groin.

The Gooch splint should not be made too wide, and should certainly not surround the thigh and leg to more than two-thirds of their circumference. It should be scooped away laterally, at a part corresponding to the site of the excision, and should have an aperture cut corresponding to the tendo Achillis and heel. The inferior extremity of the splint is thus of a horse-shoe or stirrup shape, and admits of the ankle and foot being supported by the lateral horns of the splint, as they fold on each side of the malleoli, without the risk of inordinate pressure being made upon the tuberosity of the os calcis.

In application, the limb is first laid and carefully adjusted upon the posterior splint, which should preliminarily be padded with lint, and covered with gutta-percha tissue, or hot paraffine, in the situation which corresponds to the site of operation. The iron rod is then placed in front, and folded

lint laid between it and the limb at the groin (where the rod terminates above), at the upper part of the tibia, and at the bend of the ankle. These two parts of the apparatus are then retained in contact with the limb by means of an *open wove* roller bandage applied from the toes upwards, the site of the incision alone being left uncovered. The whole is then rendered immovable by means either of plaster-of-Paris applied by the hand, of a

FIG. 2.



Posterior "Gooch" splint of ordinary form—hollowed out on each side of the level of the operation wound, and cut out at the lower part in a horse-shoe or stirrup form, so as to relieve the heel and tendo Achillis from any pressure.

FIG. 3.

Alternative form of "Gooch" splints for excision, hollowed out as in Fig. 2.; the rounded part above adapted to the os innominatum, and secured by means of strips of adhesive plaster.

consistence like thick cream, or of paraffine, which, having been rendered temporarily liquid by being heated, is applied by a large, painters' brush, When the application has solidified, the patient may then be removed to bed. and the limb suspended from the running pulley of a Salter's swinging cradle, or from the roof-bar of the common iron-wire cradle employed to support the weight of the bed-clothes. I do not regard it as a matter of indifference whether plaster-of-Paris or paraffine is used. Each has its advantages. The plaster-of-Paris is firmer, and not liable to be affected by heat like paraffine, but it has the disadvantage of permitting soakage of discharge; it takes longer to consolidate, and when consolidated, is less easily clipped through by means of bandage-shears than the paraffine apparatus. I have of late, in the treatment of excisions and of compound fractures, employed the plaster-of-Paris as the substantial substratum, and thereafter applied the paraffine over it as soon as consolidation and drying has become complete, so as to secure its greater toughness, and its complete impermeability to fluids of any kind, whether blood, serum, or pus, from the line of incision, or water from the wet dressings which may be applied during the healing of the wound. The foot and limb should not be much raised above the level of the mattress upon which the patient lies, as this is apt to lead to an awkward position of the limb when the patient first begins to move about. When in bed, the sacrum and hips must be protected from all risk of inordinate pressure, by means of a large square corrugated air-cushion completely covered with a blanket and draw-sheet. This will be found to be most evenly and comfortably supported upon a firm hair mattress, laid either on a thick hair paillasse, or better, a spring-bed. The patient should be encouraged to sit up as much in bed as possible, even within a day or two of the operation, and as soon as it is possible should be removed out of bed during the day, either to another bed or couch, or should such be not attainable, to a mattress laid upon the floor. In sitting up, the air-pillow placed beneath upon the seat will be found a great comfort, as it admits of easy relief to the irksomeness of maintaining nearly the same sitting posture for a period of several hours.

The chief merits which I have observed in this method of after-treatment are;—1. The comparative comfort the patient experiences from the ease with which he can shift his lying posture or assume the sitting position without disturbing the adjustment; 2. The facility with which dressings are applied without detaching or removing any portion of the apparatus; 3. The permanence of the apparatus, never requiring, when properly applied in the first instance, to be renewed during the whole period of after-treatment; 4. The ease with which the apparatus can be obtained, its simplicity and cheapness.

An iron rod, easily procured from any smith, a long Gooch splint, fashioned for the purpose by the carpenter, or made of two common Gooch splints, of a size suited for the thigh or leg, stitched together, and then cut to suit the limb in length and contour, two *open wove* bandages, a pound of gypsum, and a couple of ounces of paraffine, are all the requirements. A few points, even in regard to such simple matters, may as well be mentioned. The measurements for the iron rod should be made by the surgeon himself, and in making them, he should commence from below upwards, measuring in detail with a piece of common tape. The measurement, from the tip of the toes to the flexure of the ankle, should first be made for the foot-piece; then, from there, to an inch below the tuberosity of the tibia, for the leg-piece; then, five or six inches should be allowed for the diameter of the portion of a circle which arches over the knee; and, last of all, the measurement for the length of the thigh portion should be made from two inches above the patella, to the fold of the groin. This allows for the ordinary amount of bone removed in the incision, which usually varies from one and a half inch to two inches. If these measurements are not carefully taken, the surgeon may find to his annoyance a rod quite unsuited to the limb presented to him for application after the completion of the operation, which will necessarily delay the final adjustment till a properly constructed rod has been procured.

The Gooch splint should not be made too broad, nor of too *thin* wood. The amount and extent of the cutting out on each side of the splint is of less moment. If not sufficient, it can easily be rectified by means of a pocket-knife at the time of the operation. The opening below for the heel and tendo Achillis should, however, be seen to, that it may be at least three-quarters of an inch wider than the transverse width of the tuberosity of the os calcis. If it is not so, it is apt to press unpleasantly, even when well padded, against the malleoli. Should this have been overlooked, and occasion annoyance after the apparatus has been applied, the pressure can easily be relieved at any time by inserting a portion of wood beneath the heel, between the two lateral extremities of the splint, where they project beyond the sole of the foot. This piece of wood, to be of use, must be longer than the greatest breadth of the malleoli.

It has been oftener than once suggested to me that, with the gypsum bandage, the Gooch splint, or, in fact, any posterior splint, is an uncalled-for addition and complication of the apparatus. I think this is a mistake, for, after the operation, when the parts are very movable and easy of displacement, even when the patient is fully chloroformed, it affords a great additional security that the apposition of the cut osseous surfaces shall be maintained till the gypsum has consolidated, that we can adjust the limb upon a splint. Thus it is rendered more firm than it could possibly be with the rod alone, not only during the application of the bandages, and the application and setting of the cream of gypsum, but throughout the whole period the apparatus is retained. Furthermore, the splint behind serves to diffuse the pressure of the bandage, and to prevent its girding the limb, and interfering with its circulation. The open wove bandages are preferable to the common cotton or linen bandages, because their open structure fits them better for readily absorbing the gypsum, and forming along with it a tough and hard case, softly padded on its inner surface.

The gypsum may sometimes constitute a difficulty in employing this apparatus. When the plaster-of-Paris is of fresh quality, recently burnt, or, at least, if old, secured from air and moisture, since it was first burned and

ground, in an air-tight case, no difficulty should be experienced. Mistakes may be made by one unused to its application, in mingling it with water; and the usual mistake is rather on the side of making the cream too thick than too thin. The plaster powder can usually be best mingled by being sprinkled into the water from the one hand, while the plaster and water are stirred together with the other. This should be effected in a common wash-hand basin. If experienced in the use of the gypsum, or if possessed of an abundant supply, the whole quantity likely to be required may be prepared at once, just before it is to be applied. If, however, the operator is inexperienced or inexpert in its employment, he may have it made in two or more smaller quantities, so as to secure himself against the plaster hardening too quickly for his rate of application.

I have been asked if this method of treatment is original? So far as I know, the only anterior suspension splint which has been employed or recommended is that of Dr. Nathan Smith, of Baltimore. The nature of that splint, and its essential difference from the splint and apparatus I have just described, will be at once perceived from the following extract from Professor Gross's work on Surgery:—

"Professor N. R. Smith has for a long time treated fractures of the thigh with great ease and success with what he calls the *anterior splint*. It consists of a single piece, made of wire, of the size of a No. 10 bougie, and bent at each extremity—the whole representing the form of a long parallelogram, 3 inches wide above, and 2¾ inches below. It must be long enough to reach from a point a little above the anterior spinous process of the ilium, to an inch beyond the toes, when the thigh, leg, and foot are extended, 3 feet 8 inches being a good average length for adults. The side pieces are firmly connected by cross pieces, at a distance of about 8 inches. Thus constructed, the wire frame is easily bent to suit the case in hand. The angle at the tibio-tarsal joint, 6 inches from the extremity, is about 120°, to secure an easy posture for the foot; that at the knee, and the one at the hip are each about 160°—the latter being 7 inches from the upper extremity. The splint, properly padded, or lightly wrapped with a muslin bandage, and secured to the limb by a roller extended from the toes upwards, is suspended, by means of a pulley, cord, and loops, to the ceiling—a compress being placed upon the instep, and another upon the groin, to ward off pressure. The proper position of the hooks is a matter of great consequence. In general, the upper one should be attached nearly over the seat of the fracture, and the lower a little above the middle of the leg,—the object being thoroughly to equalize the pressure of the splint. The roller confining the apparatus should be well stitched, to prevent it from slipping, and great care taken that it do not make undue constriction. This apparatus, the efficacy of which has been thoroughly tested in numerous cases, is exceedingly light and comfortable, and is equally well adapted to fractures of the thigh and leg, in every portion of their extent."

This apparatus of Dr. Smith would, I have no doubt, be perfectly capable of adaptation to cases of excision of the knee, just as it is for cases of compound or gunshot fractures of the thigh or leg, or for cases of excision of the head of the femur; but the advantage over the single rod apparatus would, I think, be more than doubtful. Its double line of wire on the outer and inner side of the anterior aspect of the limb would, I should fear, give rise to a considerable interference with the line of incision, while the want of the posterior splint and the adherent gypsum bandage, which forms an essential part of the apparatus I now recommend, would detract considerably from the firmness and immobility of the leg and thigh during the process of gradual healing and consolidation.

[Dr. Watson concludes his article on the above-named operation by a consideration of the following moot points connected with it.]

First, then, with reference to the allegation that incisions freely laying open the whole extent of a suppurating joint, combined with complete repose, effected by splints, gypsum apparatus, starch bandages, or otherwise, may with perfect propriety be substituted in most cases where excision of the articulation could be satisfactorily substituted for amputation. Such

a statement can only hold good where the lower extremity is concerned, and where the limb is nearly in the straight position, or where with tenotomy and forcible extension under chloroform a like position could be obtained. I apprehend, in all such cases, there is a very great difference in the after progress and result to be observed from the conditions obtained by excision. Where the bones undergoing more or less diseased action are kept in steady contact, no excision being practised, the tension and counter pressure of the osseous surfaces thus maintained must tend, in many cases, to determine farther suppurative progress, farther ulceration, it may be, in some cases, actual necrosis of considerable fragments of the cancellated tissue of the opposed bony surfaces. When, on the other hand, excision is practised, complete relief is at once afforded to all the tension, and ill results due to further destruction within the limits of the field of operation rarely occur.

2. It may, perhaps, be asked, when such admirable results are obtained from excision of the elbow-joint, in the shape of a movable articulation, scarcely less useful or seemly than the natural joint, and infinitely more serviceable than an anchylosed one, why should we rest content in excision of the knee with a stiff limb? There are both theoretical and practical objections to this suggestion. The theoretical or analogical reasons are: 1. That the elbow-joint is useful in virtue of its freedom of movement in every direction, so long as the approximated osseous surfaces do not actually pass each other, while in the knee any movement which interferes with the complete rigidity of the limb as a column of support, capable of sustaining the weight of the whole trunk, renders the limb almost unserviceable in progression. When, for example, the muscles fail to lock the knee-joint in complete extension, walking is almost an impossibility. Again, while an ununited fracture of the arm is more an annoyance than a cause of incapacity in the affected arm, an ununited fracture of the thigh disables the patient till the limb is in some way rendered rigid. It is further easily demonstrated in any case of excision of the elbow-joint where the arm is in every respect most perfectly useful as a prehensive organ, that the patient can rest no weight upon it. I have seen a patient whose elbow-joint has been excised scrubbing a floor most energetically with the affected arm, and resting her weight upon the sound limb; on asking her to transfer the scrubbing-brush to the hand of the sound limb and support herself upon the arm operated upon, in making the attempt she at once fell over upon that side, the limb doubling beneath her weight. There is this manifest difficulty in attempting, in excision of the knee-joint, to obtain a movable articulation which shall be of any use to the patient, that in making the union flexible in one direction it must be flexible in all directions equally. Thus the tendency to bend outwards or inwards would be as great as the extent of the motions of flexion extension, and as we have seen that in the after treatment there is a tendency to bow outwards, this would in all probability be the direction in which the flexure of the limb would occur when the weight of the body was borne upon that extremity. 2. The practical difficulties which have occurred in attempting the formation of a useful limb with only a fibrous union at the site of the excision are, I think, sufficient, so far as our knowledge at present goes, to forbid its repetition. It is no new proposal this of a movable joint. Mr. Syme, so long ago as 1831, seems, in his early essays, to have been in favour of such an attempt. He says:—"During the cure it does not seem proper to insure absolute rest in order to obtain a true anchylosis or osseous union, since the very long bone that would thus be formed, besides being extremely inconvenient to the patient, by rendering the limb perfectly rigid, could not fail to expose it to a great risk of fracture, by affording long levers to forces acting at the extremities. A great degree of flexibility, on the other hand, would unfit the limb for support and progressive motion, so that while perfect immobility and free motion ought to be avoided, a slight degree of flexibility ought to be promoted. The chief difficulty of the cure consists in preventing the tendency to bend outwards, which is always strong, and, if not counteracted, most injurious to the appearance and usefulness of the limb.

I am also informed that in those cases in which Langenbeck has performed

excision of the knee, he has adopted measures calculated to obtain a movable articulation, but that the result has been the necessity of resorting to amputation in every case. Such are the reasons, theoretical and practical, which have prevented me from making any attempt in this direction, and which meanwhile appear to me likely to influence practical surgeons against the adoption of a method of after treatment calculated to obtain such unsatisfactory results.

3. The method by which I have practised the excision has, in every instance except one, been by means of the semilunar incision, raising a long flap from the anterior surface of the articulation. The one exceptional case in which I employed an elliptical incision, crossing the front of the joint, and including the patella within its limits, was one in which the operation was practised on account of compound comminuted fracture of the patella. Here the lacerated condition of the integuments, together with the necessity to effect the removal of the comminuted bone, made this method preferable to any other. In employing the long anterior flap as a means of gaining access to the articulation, I have preferred it for four reasons, chiefly:—1. That while it opens up the parts to be dealt with to both sight and touch more thoroughly than any other, it is easily and rapidly mapped out by a single curvilinear sweep of the knife. 2. That when its extremities are carried behind the line to the condyles they form a complete and efficient drain for the whole extent of the cavity formed by the incision. 3. That its margin corresponds in a less degree than any other to the line of section of the osseous surfaces. 4. That the flap so raised will serve for amputation of the thigh through the condyles, should the state of the joint render that advisable after excision has been completed. The H incision, the simple transverse incision, the lateral incisions, both straight, or one straight and the other curvilinear, I have employed on several occasions in operating upon the dead body, but none of them have seemed to me to possess any such superiority over the long flap as to lead me to employ it in practice. They have certain advantages, it is true, which I readily grant, such as admitting in the case of the H, the transverse, or the elliptical incision, a more easy removal of the patella, if that is thought essential or desirable in any given case; but as I have always attempted to retain the patella where this is possible, incisions specially suited to favour its easy removal have not seemed to me to possess any advantage in this operation. If the articular surface of the patella is affected by disease, the gouge will usually enable its diseased tissue to be easily removed to the desired limits as regards both superficial extent and depth. Besides, it is well to bear in mind the practical fact that it is rare to find any such extent of disease in the patella as to determine the necessity for its removal,—an observation in morbid anatomy which its position as a sesamoid bone might almost lead one *à priori* to anticipate. The lateral forms of incision, straight on each side, or straight on the inside of the knee and curvilinear upon the outside, were devised for the purpose of leaving, not only the patella intact, but the ligamentum patellæ as well. This may seem at first sight an advantage, and were a useful movable articulation attainable as a result, it would be so without doubt; but as such has not hitherto been known to follow upon this method of operating, the difficulties which it creates in the manual procedure should be sufficient to condemn it.

Perhaps it may be asked, why I have retained the patella? My reply is, that (1) its removal is unnecessary in most cases; (2) its presence in the flap bears up the soft parts from the line of incision, and, without preventing consolidation, helps to keep them away from the cut margin of either osseous surface; (3) that its removal occasions more bleeding; and (4) that the hollow left after its removal from the centre of the long flap leaves a hollow cavity in which matter bags, and requires a separate incision to drain it efficiently.

4. The patients whose cases I have narrated are all adults. I have not performed the operation in any child or adolescent. I have been deterred from doing so by the small prospect which the removal of the epiphysis of

the femur and tibia must afford of the after growth of the limb proving commensurate to that of the rest of the body. In children I have hitherto regarded amputation as a preferable operative procedure. I believe I shall continue to do so until I have had satisfactory evidence that the limb grows, or that the short and shrunken limb is capable, with the aid of a wooden pin, to support the superincumbent weight of an adult body more satisfactorily than a thigh stump and a wooden leg.

5. In regard to instruments requisite for the performance of the operation, I need say nothing further than that I have required nothing more than a large bistoury in a firm handle, and a common amputation-saw with a back which yields as the blade cuts its way through the condyles of the femur or broad head of the tibia. Various ingenious devices have, however, been recommended and employed by others in this extremely simple operation for dividing the osseous tissues. Among these, Mr. Butcher's saw, Symonovsky's saw modified by Lüer, the old double-toothed saw of Moreau, and the chain saw recommended by the late Dr. Jaffray of Glasgow, in his edition of Park and Moreau's works on excision of the joints, specially deserve mention. There can certainly be no objection taken to their employment if the section of the bone were more easily or nicely effected by means of them than by the common amputation-saw. But as one and all of them are less easily manipulated, and there is no evidence in favour of their effecting this work more smoothly, I cannot conceive why instruments, certainly well suited for the key-hole work or the pattern sawing of the cabinet-maker, should be imported into the armamentarium of surgery, or made of such great moment in the performance of an operation which requires neither sections in curves, in zigzags, nor in dovetail patterns.

I once heard a surgeon desiderating some instrument by which two smooth sections of the tibia and femur might be easily effected in excision of the knee, as he had seen difficulties occur from a want of capacity in the operator to cut two flat surfaces, which, when laid *in situ*, produced a straight limb. It may have been a legitimate wish upon the part of so clumsy an operator, and were the saws we have named capable of affording such facilities, we should strongly recommend them to his attention; but as they are certainly not fitted to afford such assistance, a simpler expedient would perhaps be more easy of adoption, viz., that until a man acquires the very moderate degree of command over his hands and eyes necessary for the performance of so simple an operation, he had much better totally abstain from engaging in the operative department of his profession.—*Edinburgh Medical Journal, January and April*, 1867, *pp.* 607 *and* 935.

42.—ON CASES THAT BONE-SETTERS CURE.

By James Paget, Esq., Surgeon to St. Bartholomew's Hospital.

[In the large majority of cases the treatment adopted by bone-setters, in all cases of injury to joints of whatever nature, is wrenching and other movements of them. It is impossible to estimate the amount of mischief which may be done by this treatment, but it is sufficient to know that it sometimes does good.]

What, then, are the cases that bone-setters cure with their practice of wrenching?

First, of course, they have a certain number of real fractures and dislocations which they reduce, and of old ankyloses which they loosen. Of these I need say nothing; for I believe there is nothing in their practice in these, cases which is not as well, or better, done by regular surgical rules.

Next, there is a rare accident which a wrench may cure, and which, if you are not on your guard, you may fail to make out; namely, the slipping of a tendon. I have known the tendon of a peroneous longus slip to the front of the outer malleolus; and an extensor tendon of a finger slip over the heads of the metacarpal bone and first phalanx; and here, from our museum, is the

long tendon of a biceps slipped from its groove. Of these accidents, the first two may be made out by feeling the displaced tendon and the gap where it should be; the third may be at least guessed at by the signs which Mr. Soden has pointed out in his case, related in the *Medico-Chirurgical Transactions;* the slight forward prominence of the head of the humerus, its drawing up under the acromion, and the pain at the lower end of the biceps on stretching it. As to this displacement, however, I doubt whether it would be ever so certainly made out as to be fairly reduced; the others, at the ankle and the finger, should be remedied by relaxing the slipped tendon as extremely as possible, and replacing it with lateral pressure and sudden stretching.

Some other tendons may slip, I believe, like these; the tendon of the popliteus appears very likely to do so; and I can hardly doubt that a bone-setter has occasionally done, unwittingly, a lucky trick, when, with wrenchings and twistings of a joint, he has made some dislodged tendon slip back to its place.

But there is a set of cases much more common than these, which may be cured with wrenching and rough movements; namely, the so-called internal derangements of joints. The knee-joint is by far the most frequent seat of this injury, whatever it is; but the like occurs in the lower jaw-joint; and I have known very similar signs of injury at the hip and elbow. The most marked sign is that, while the joint is being moved in some ordinary action, something is felt slipping or suddenly caught between the bones, and a great pain comes, and the joint is locked. It will move in one direction, not in the opposite one: just like a hinge with a stone in it (as a patient described it to me). The locking of the joint, which is, usually, at moderate flexion, is soon followed by effusion of fluid into it, and other signs of more or less acute inflammation of the synovial membrane; and, if nothing be done, these last for some days, or even for some weeks, before, with subsidence of the inflammation, the joint gradually regains mobility.

Many of these symptoms are like those due to a loose piece of cartilage in a joint—a much rarer condition. But, with loose cartilages, joints are not, I think, often locked for any length of time; they are stopped with extreme pain when the cartilage gets between the bones, but it soon escapes and they go again. In some of the cases of what I am calling locked joint, at the knee or lower jaw, it is probable that one of the interarticular cartilages slips and is nipped between the bones. We have, in the museum, a cast from a knee in which it is certain that this happened. But in some cases it seems more likely that a fold of synovial membrane, or a portion of capsule, is caught and nipped. However we may explain the accident, it is one of those that may be cured by the bone-setters. Such movements as theirs are not indeed necessary; and none should be practiced recklessly or without plan; but force may be requisite, and, if used knowingly, will certainly set a locked joint right again.

Sometimes a patient learns for himself how to unlock his joint, and can do it gently, first, in the case of the knee, bending, and then with slight rotation slowly stretching it. But he may need more force than he can use for himself; and you may apply it better than a bone-setter can.

In the case of the knee, the "lock" usually takes place with the joint moderately bent and the leg rotated outwards. You must unlock it by extremely bending the joint, then rotating the leg inwards, and then suddenly and forcibly extending it. In the same manner, for any other joint that appears to slip and lock, you must observe the direction in which the patient can easily move it, and the direction in which movement is impossible or very painful; then you must move it, first, extremely in the former direction, and, secondly, forcibly in the latter. The manœuvre is sometimes extremely painful; and the force required for success may be greatly augmented by muscular resistance. In either case, the use of ether or chloroform may ease both the patient and yourself.

A fourth set of cases that may be cured with wrenching, or other forcible movements, includes those in which injured joints are held stiff, or nearly stiff, by involuntary muscular action. You may meet with such cases in patients

of any age; but they are most frequent among the young. Sometimes after well treated fracture near a joint; sometimes after a sprain; sometimes when a joint has been hit hard—stiffness remains, which is due solely to muscular action; and this stiffness in some cases is constant, and in others ensues on slight attempts at motion.

Any joint, I believe, may be in this condition at any time after an injury. I have seen it at the elbow, shoulder, cervical spine, hip, knee, and ankle; in some instances a few hours after the injury, in some, several weeks. You may know this muscular kind of stiff joint by this, among other signs, that the stiffness is not a dead block, as if by meeting of displaced bones, nor has rigid resistance, but yields a little, as if with the "giving" of a firm elastic substance which instantly recoils. Besides, you may generally feel the muscles in action; not hard and vibrating, as if with all their force, but firm, steady, and resisting. If, however, you have any doubt about the diagnosis, chloroform will settle it. As soon as the patient becomes quite insensible, the muscles relax, and the previously stiff joint becomes freely movable.

Herein appears the best mode of cure. Bone-setters violently move the joints against the muscular resistance till the muscles are wearied and beaten, and you may do the same; but the proceeding is very painful, and often needs a painful repetition. A far better plan is to have the patient under chloroform, and move the joint quietly, and then to confine it with splints in a posture opposed to that in which it was stiff. After a few days, it may be moderately exercised, douched, and shampooed; but in the intervals of this treatment the joint should be confined with the splints, if it should appear to be becoming stiff again.

You may sometimes see another condition, very like this involuntary muscular rigidity of joints, in young children. If one of its limbs be hurt, a young child will sometimes hold the limb steadily in one position, and complain if it be moved. Thus, a child, whose thigh has been strained, will stand on the other leg and keep the hurt thigh lifted up, as if for extreme disease of the hip joint; or, for similar hurts, will, for even many days, keep its arm close to its side, or its elbow-joint steadily bent.

Perhaps some of these cases are the same as those I last spoke of; but in many of them the muscular fixing of the part has seemed to me not involuntary. It is more like a trick, or an instinct of fright, lest the part should be hurt again. Certainly, the muscles relax instantly in sleep, and not unfrequently when the attention is distracted from them.

I suppose that bone-setters would cure this state with their panaceal pulling; but, happily, they are allowed to have but little practice among children. Happily, I say, for children's joints are much more imperilled by violence than are those of older patients; and you cannot be too cautious in concluding, when a child holds a joint fixed, that there really is no disease or serious injury. All the evidence must be negative; and an oversight may be disastrous.

However, you need not use any kind of force in this kind of contraction in a child. If the part be only allowed a few days' rest, it will get well; unless, indeed, it be seriously damaged—in which case, you will have done well by avoiding all violence.

In another set of cases, there is no doubt of the voluntary character of the muscular rigidity of a joint. You saw lately a girl in Lawrence Ward who wilfully resisted all movements of a hip that had been only slightly hurt. If a bone-setter had wrenched her joint, it might have served her right, and the pain might have cured her temper. But she recovered just as well when she saw that she did not deceive us and was not pitied.

Now, among all these cases of muscular difficulty, there is a good harvest for bone-setters; and, without doubt, their remedy, rough as it is, is often real. Yours may be as real, with much less violence; and, with better diagnosis than they can ever make, you may do none of the harm that they often do.

But there is a yet larger class of cases which bone-setters sometimes succeed in curing very quickly; namely, ordinary sprains.

I cannot doubt that some recently sprained joints may be quickly cured,

freed from pain, and restored to useful power, by gradually increased violence of rubbing and moving. This method of treatment has many times been introduced into regular surgery; but it has never been generally adopted, or, I think, long practiced by any one. I suspect that it sometimes does no good, and sometimes does harm enough to disgust an honest surgeon.

I believe that the best mode of applying this plan of treatment is, to begin by handling, rubbing, and pressing the sprained part and its neighbouring structures very gently. After doing this for fifteen or twenty minutes, the rubbing and pressing may be increased in hardness, and the joint may be more freely moved, especially in the direction opposite to that in which it was forced by the accident. Another quarter of an hour or more thus spent, is to be followed by rougher proceedings of the same kind, till even severe pressure and wide and violent movements can be borne without pain; and then, in an hour or so, the cure is deemed complete, or so nearly complete as to require only a slighter treatment of the same kind on the next day.

I cannot tell you in what kind or proportion of recent sprains you may employ this treatment; indeed, I cannot advise you to use it at all, unless by way of trial in very healthy men. For I do not doubt that it will sometimes do harm; and the greater quickness of cure which it may achieve is not worth a risk, while we can always employ such safe, and not slow, means as the combined rest and support of the sprained parts which are given by strapping or the starched or plaster-of-Paris bandage. In short, this rough-rubbing and hard-pulling treatment of recent sprains seems to me one of those dangerous remedies which, though I believe in their occasional utility, I would rather not employ till I can discriminate the cases in which they will do good from those in which they will do harm.

Such discrimination, difficult as it may be among recent sprains, is not very difficult among old ones; that is, among cases in which the ill effects of sprains remain long uncured. It is among these cases that bone-setters, and especially those who combine rubbing and shampooing with their "setting," gain their chief repute.

Among "old sprains," you will find a strange variety of cases—chronically inflamed joints, each probably bearing the marks of the constitutional disease or unsoundness of its possessor; and loose joints, and slipping, and creaking, and weak, and irritable joints, and many more. To all these, mere bone-setting does harm, or no good; and rubbing and shampooing are of little, if any, use; indeed, to a really inflamed joint they would generally be mischievous. But among "old sprains" are not a few cases in which a joint, after long treatment, remains or becomes habitually cold. It is generally stiffish and weak, sensitive, aching after movement, or in the evening or at night, sometimes swollen, puffy, or œdematous, but not with an "œdema calidum." Whatever else it is, it is cold, or, at the most, not warmer than the healthy fellow-joint. Among these cold joints, bone-setters and rubbers gain, as I said, great repute; and all the more because they often get the cases after the patients have become tired and discontented with a rather over-careful surgery. Admirable as is the rule of treating injured joints with rest, such rest may be too long continued; and in every case in which it has done full good, it must, in due time, be left off. With rest too long maintained, a joint becomes or remains stiff and weak and over-sensitive, even though there be no morbid process in it; and this mischief is increased if the joint have been too long bandaged, and still more if it have been treated with the cold douche.

I need hardly say that it may be sometimes difficult to decide the time at which rest, after having been highly beneficial, may become injurious; or that the decision is always a matter of grave importance. On the other hand, you and the patient may be losing time through over-caution; on the other, the risk may be incurred, through rashness, of renewing inflammation in a damaged joint. I believe you will be safe, if you will take the temperature of the part for your guidance. If the part be always over-warm, keep it quiet; if it be generally cold, or cool, it needs and will bear exercise and freedom from restraint of bandages, with friction and passive movements, and

other similar treatment of the reviving kind. And of this you may be the more sure when the cold integuments over the joint are dusky pink or purplish, or become so when the limb hangs down, and when there is little swelling, and when pain is much greater than is accounted for by any appearance of disease.

I do not know whether bone-setters make any discrimination among these cases; and I do not advise you to adopt their rough method in any case; for though they may, when successful, prove emphatically the utility of movements for old sprains, yet the same good may be more safely done with gentler means of the same kind. Exercise of the hurt part should be gradually increased, and always followed by long repose; and the frictions and shampooings should be gradually made harder and more rough, and the passive movements gradually extended. Always, the part, if itself cold, should be, by any means, kept warm; and always the patient's constitutional defects should be watched, and, if possible, amended; for very commonly the chief hindrance to the recovery of a sprain is not local, but some general wrong—gout, chronic rheumatism, or struma, or hysteria, as it is called.

An "hysterical joint" is, indeed, sometimes a rare opportunity for a victory for a bone-setter. Cold, weak, useless for want of power of will, intensely sensitive, subject to all the seeming caprices of a disorderly spinal cord and too vivid brain,—such a joint as this may be cured by the sheer audacity with which it is pulled about. If nothing in it but its portion of the nervous system is in fault, this may be sometimes cured through influence on the mind. And so not only bone-setters, but the workers with Mesmerism, and tractors, and oils, and distant or superficial electricity, can sometimes cure hysterical joints: for the patients love to be cured with a wonder; and the audacious confidence of all these conjurors is truly wonderful.

From all this, you may see, that the cases that bone-setters may cure, though more by luck than by wit, are not a few. I think it very probable that those in which they do harm are still more numerous; but the lessons which you may learn from their practice are plain and useful.

Many more cases of injured joints than are commonly supposed to be thus curable, may be successfully treated with rough movements—wrenching, pulling, and twisting. The cases that are thus curable I have endeavored to point out to you. Be on the watch for them. But remember always that what may be treated violently may be treated more safely and as successfully with comparative gentleness; and that, in some cases, you may very advantageously use chloroform or ether. And remember, also, that no degree of violence, not even such movements or exercises as I have advised, can be generally safe in the treatment of injured joints, unless when directed with a skilful discernment of the appropriate cases.

Learn then to imitate what is good and avoid what is bad in the practice of bone-setters; and, if you would still further observe the rule, *Fas est ab hoste doceri*, which is in no calling wiser than in ours, learn next what you can from the practice of rubbers and plaisterers: for these also know many clever tricks; and, if they had but educated brains to guide their strong and pliant hands, they might be most skilful curers of bad joints and many other hindrances of locomotion.—*British Medical Journal, Jan.* 5, 1867, *p.* 1.

43.—ON A NEW STYPTIC AND ADHESIVE FLUID—STYPTIC COLLOID.

By Dr Benjamin W. Richardson, M. A., Senior Physician to the Royal Infirmary for Diseases of the Chest.

[The fluid named by Dr. Richardson "Styptic colloid" is a compound fluid which is at one and the same time a styptic, an antiseptic, and a complete means of excluding wounded, abraded, or ulcerated parts of the body from the influence of the external air.]

My mind was led to this matter as long back as the year 1852. In that

year Signor Pagliari, of Rome, announced the discovery of a new styptic, possessing, as he asserted, remarkable properties for arresting hemorrhage. Having made some of this solution, I subjected it to careful experiment, and reported the results to the Medical Society of London. The report based on the facts elicited was not favourable to the new remedy, and as other experience of it confirmed my own it soon lost the popularity that at first surrounded it. The styptic of Pagliari was composed as follows :—

Gum Benzoin, eight ounces;
Alum, one pound;
Water, eight pints.

The alum and the benzoin were boiled for eight hours in water, fresh water being added to make up the loss by boiling. The solution as a styptic was found inferior to lunar caustic; but it was superior to a simple solution of alum. It was antiseptic, but was not adhesive.

In succeeding years I made several attempts to produce a better fluid; but it was not until last year, when I was specially studying the applications of ether to practice, that I saw the true principles on which to proceed.

The use of collodion, or gun-cotton dissolved in ether, had for some years been recognised as of great service in covering wounds, and as I found that collodion was very easily diffusible in the form of spray, it seemed to me that it might be applied in that form with advantage, and might even be made to coat a bleeding open surface. But on experiment it came out that, in whatever way applied, collodion fulfils but a small part of the required duty as a styptic and a wound-healer. In the first place, it mixes indifferently with blood; in the second place, it forms but an imperfect adhesion; and lastly, it allows the transudation of air through its structure when laid upon a moist surface, and particularly upon the body, which is at all times throwing off watery vapour. At the same time the principle of the collodion process was excellent: to lay down from a fluid a deposit of solid matter by the evaporation of a volatile solvent was sound and beautiful action.

The next point in advance, therefore, was to combine, if possible, with the ether and gun-cotton some other substance which, being also soluble in ether and capable of deposit by the evaporation of the ether, would combine chemically with the blood, with the albuminous exudative matter of a wound, or with purulent matter.

The idea only was wanted to secure the object in view. There was one substance which answered all these indications—I mean tannin. A mixture, therefore, of xlyoidine, a substance resembling gun-cotton, and of tannin was formed into solution with ether, and from that came what I designated "*zylo-styptic ether.*"

Brought into practice, the advantages of this solution as a means for stopping hemorrhage at once became obvious. Indeed, as a means for the arrest of hemorrhage, less than the application of a ligature to an open vessel, the spray leaves little to be desired. The extreme cold produced by the evaporation of the ether acts directly on the water of the blood, the tannin solidifies the blood by combining with it, and the cotton acts as a plug: thus every indication for arrest of hemorrhage is secured.

But in observing the action of the styptic spray, I soon became impressed with another fact—viz., that after the application to decomposing and fœtid wounds and sores the fœtor entirely disappeared, the wounds commenced to heal with great rapidity, and a kind of natural covering appeared to form out of the secretion by its combination with the dressing above it.

This observation has led me to simplify the application still further until it has come into this convenient form, a mere solution capable of being kept on the table as gum is kept, and of being applied with a soft brush in the same simple way.

The process of manufacture of the fluid is tedious, but sufficiently easy. The object to be aimed at is to saturate ether entirely with tannin, and a collodial substance, xyloidine or gun-cotton. In the first step of the process, the tannin, rendered as pure as it can be, is treated with absolute alcohol, and is made to digest in the alcohol for several days. Then the ether, also abso-

lute, is added until the whole of the thick alcoholic mixture is rendered quite fluid. Next the colloidial substance is put in until it ceases readily to dissolve. For the sake of its very agreeable odour, a little tincture of benzoin is finally admixed.

The solution is now ready for use. It can be applied directly with a brush, or, mixed with equal quantities of ether, it can be applied in the form of spray. In order to give to the fluid a short name by which it may be known, I have called it "*styptic colloid*."

Properties.—When the solution is brought into contact with an open surface of the body, the resultant phenomena are these: the heat of the body gradually volatilises the ether and the alcohol, and the tannin and cotton, as the ether leaves them, are thus left stranded on the surface in intimate combination. In proportion as the ether passes off, the blood or the secretion of the surface permeates the tannin and cotton; but tannin acts directly upon albumen, coagulating it, and transforming it into a kind of membrane, almost like leather. The cotton meanwhile unites the whole, gives substance to the mass, and adhesive quality. When all is solidified, the dressing becomes, in fact, a concrete, having a true organic hold or basis on the tissues; and as the tannin, if the solution be freely applied, is in excess, any new exudative matter or blood is for several hours taken up by it, and the annealing is made the more complete.

Thus, by this dressing, the air is excluded from every possible point in every possible direction, not by a mere septum, but by the combination of the animal fluids with the remedy; and because the air is excluded and fluid is absorbed there is no decomposition—*i. e.*, no oxidation; and because there is no oxidation there is no irritation.

The styptic and adhesive qualities of this fluid are easily demonstrated by observing its direct action on blood, on serum, on pus, on albumen. You will see that it solidifies all these by mere contact with them.

To these properties I must also add that of complete deodorisation. Here is putrid blood, here putrid ovarian serum, here putrid purulent substance. They are unapproachable when laid on an open surface, but we bring them into contact with the solution, and they are deodorised. Further, the decomposed substance is fixed by the tannin and rendered inert.

Modes of Application.—Having thus laid down the principles at work in this method of treatment, let me next pass to the modes of application. I have here an artificial limb; a portion of it is covered with thin skin to represent the ordinary skin. At one part, for the space of six inches by four, there is placed under the skin a spongy substance charged with blood and albuminous fluid. I will now make an incision through the skin, and expose the bleeding surface. Suppose this to be an open wound, the two flaps of an amputation. I close it with silk ligatures in five places. This done, I take a little cotton-wool, tease it out finely in a wineglass, and saturate it with the styptic solution. Next, with a soft camel-hair brush, I apply the solution freely over the closed wound, letting it lie between the edges. If blood exude, it simply combines with the solution, making a mass much like red wax. I lay on the solution also for a little distance beyond the wound, and wait a few moments to allow for the evaporation of ether. Next I take from the wineglass the saturated cotton-wool with forceps, and lay a seam of it half an inch wide and the eighth of an inch in thickness over the line of incision. Finally, I coat the whole over with another layer of the solution, wait until the layer is nearly dry, cover with a little dry cotton, and, if pressure be necessary, carry over the whole a bandage,

If time is a matter of importance, the evaporation of the fluid can be hastened by gently blowing with the warm breath over the solution as each layer of it is applied with the brush.

Presuming that a cavity has to be treated, the fluid is often more neatly and handily used as spray. Thus, in treating the roof of the mouth for carious bone, or in plugging a bleeding alveolar cavity after extraction of a tooth, the spray is excellent. We begin in such a case by applying the spray direct to the bleeding surface, and when a layer of deposit is formed

we use that as a foundation for a thin layer of cotton-wool ready saturated in the solution. Then we reapply the spray, and again cotton, until the whole operation is complete.

For bleeding or fœtid discharge from the uterus or vagina the spray is not advisable, because of the introduction of air. Here injection by the syringe is the best process, followed, if need be, by a plug of cotton-wool saturated with the solution.

In cases of compound fracture, after the parts have been brought into apposition as far as is possible and fixed in the necessary position, the fluid should be poured slowly into the open cavity so as to fill it. Then the parts externally should be covered with a layer of cotton wool saturated with the solution.

On open cancer, and on suppurating or decomposing surfaces, the solution may be freely applied with the brush, and afterwards the parts may be covered with cotton-wool saturated with the fluid.

In no case need there be any fear that irritation will follow the application of the solution. On the contrary, the action of it is so purely negative that it might be considered a sedative. It is not such in the technical sense of the term, but it so effectually covers the wounded and susceptible surfaces as to maintain what is virtually a sedative influence.

After a fresh wound has been once dressed with this solution, it requires but little further treatment. In the case of small wounds they may be safely left with one dressing. In process of cure the dressing will slowly be thrown off in the form of thick scale, and ligatures will also spontaneously come away. Even when the wound is very large, as after amputation, it is not desirable to try to open the wound unless there be systemic symptoms. In such case, in order to remove the dressing without pain, the bandage, if it be adherent, must be sponged at the adherent parts with a mixture of alcohol and ether, or with alcohol and water; this will set everything at liberty with ease and cleanliness. Water alone must on no account be used, neither hot nor cold.

THE FLUID IN PRACTICE.—From these directions I may now move to the recital of a few typical cases in which this solution has been employed.

Hemorrhage after Tooth Extraction.—At the request of my friend, Mr. Thomas A. Rogers, of Hanover-square, I was summoned, on May 9th, 1866, at 10 a. m., to see a young gentleman who was suffering from a dangerous hemorrhage from an alveolar cavity from which a large molar tooth had been extracted. Mr. Rogers had extracted the tooth at five o'clock on the previous evening, and from then until my arrival the bleeding had never ceased. I learned from the parents that all their children suffered from the hemorrhagic tendency in an extreme degree. The young man was now in a state of very great exhaustion, and the flow of fluid blood was still continuous. Laying him upon the floor, with his head raised, I applied the styptic in the form of spray, directly into the bleeding cavity, and with such force at first as to dislodge the little pool of blood there. Continuing the spray, I was soon gratified at seeing complete arrest of the hemorrhage. I now placed in the cavity a small pledget of cotton-wool saturated with the fluid, pressed it firmly home, and covered it with spray; thus, layer upon layer, I not only filled the cavity with cotton-wool and firmly set styptic, but builded up the space between the two adjoining teeth with the same substances until the gap in the middle looked as if filled with what the dentists call a bone block. The bleeding was entirely arrested from that moment, and recovery was perfect. There was no sign of irritation in the wound, and when, four days afterwards, the plug came away, all the structures beneath were healed.

Severe Hemorrhage from Necrosis of the Upper Maxilla.—A gentleman suffering from syphilis, extremely aggravated by excess of mercury, was last year brought under the care of my friends Messrs. Musgrave and Milson, of St. John's-wood. I saw the patient with them in consultation many times, and we were all in much anxiety in regard to the roof of the mouth. The

mucous membrane of the roof was thickened, red, percolated, and offensive; the fœtor was almost unbearable, and every evidence of necrosed bone was present. The soft covering of the palate at length gave way, the soft parts ulcerated, and about midnight on October 16, the necrosed bone loosened, and was partly displaced. In this way, the two descending palatine arteries were severed, and the most sudden and profuse hemorrhage followed. I was summoned, and soon after my arrival, Mr. Milson also came. Unfortunately, we had to send some distance for the styptic fluid, but meanwhile we tried, quite ineffectually, to plug with the perchloride of iron, and were compelled to trust to pressure with the fingers. When the styptic arrived, we played it freely in the form of spray over the bleeding points, and with instant effect in stopping the loss of blood. Then we plugged carefully with cotton, saturating each layer with the spray, and soon the mass set firmly, and no more blood was lost. By the time we had controlled the bleeding, we were gratified by the arrival of Mr. Paget, whom we had summoned; and as he, from having already tried the styptic, was content to trust to it, we did no more. It is the fact that this patient lost five pints of blood before the fluid was used, but the hemorrhage did not return, the fœtor no longer was present; and a few days later, assisted by Mr. Milson, I removed the dead bone. The removal laid bare a wide ulcerated surface or cavity, which we continued to plug with the styptic on cotton-wool; and so perfect has been the healing process that the cavity would now bear an artificial plate.

In Open Ulcer.—The styptic solution is equally good in cases of ulceration in other parts of the body, and from other causes. The son of a medical man was brought to me with a large, deep ulcer on the face. The boy had a strumous taint, and for three months various remedies had been applied without any avail. I simply painted over the surface of the ulcer freely with the solution, and ordered that it should be steadily applied whenever there was fresh oozing of purulent matter. The result towards cure was favourable beyond expectation, and in nineteen days the ulcer healed.

In Cancer.—My friend, the late Mr. Hitchman, of Leamington, consulted me in reference to a case of large, open, malignant ulcer of the breast in a woman of middle age. The discharge was most abundant, and the fœtor intolerable. Here, again, I suggested the free use of the styptic solution, and with the most useful effect. Pain was soothed by it, the discharge was arrested, and the fœtor was completely removed. The death of Mr. Hitchman has prevented me from knowing the result of the case, but in his last letter to me he reported that no previous treatment had given so much relief, and that the broken surface was contracting, and was, he thought, inclined to heal.

For Recent Wounds.—Leaving these cases of hemorrhage and of ulceration, I pass to the effect of the fluid in promoting the healing of recent wounds.

A lady, between 70 and 80 years of age, in coming from her bedroom caught her foot in the carpet and fell foremost on her head, receiving, by striking against a box, a large and severe wound on her forehead. The wound, triangular in shape, raised a portion of skin three inches long on two sides of the triangle. I treated the wound by putting in one suture at the apex of the triangle, and then painting the edges with the solution and covering them with cotton-wool saturated in the solution. Not another dressing was required; the wound healed at once without the slightest discharge, and leaving scarcely a scar.

In Amputation.—But the best case of recent wounds which I have to report is that of an amputation treated by the fluid as the dressing. The patient, a young gentleman, was under the care of Mr. W. Adams for extreme deformity of the foot, requiring amputation by Chopart's operation. The operation was performed on Wednesday, February 13th of this year, and as the cuboid bone and os calcis were anchylosed, the saw had to be freely used. Several vessels had to be tied, and the ligatures were left in the usual way, suspended from the wound. When the lips of the wound had been brought together by wire suture, I coated the wound freely with the fluid, and the bandage was applied. Three days later there was no fœtor, no dis-

charge, and no general symptoms, but as Mr. Adams was anxious to see the condition of the wound, I undressed it. To our delight, we found it healed throughout, but, unfortunately, from the bandage adhering to one of the long ligatures, I, in removing it there, tore open the newly-healed wound for the space of a quarter inch. At this broken spot about a teaspoonful of purulent matter formed two days later; but this little break was very quickly reunited, and on the sixteenth day after the operation the patient was able to return to the country with complete healing by the first intention, and without having suffered from one symptom of a constitutional kind.

I was never more indebted than to Mr. Adams for allowing me to put the fluid to this crucial test, nor can I thank him for this without also thanking him for permitting me to practice, and that also successfully, local anæsthesia by the ether spray in the first great cutting operations—viz., for the removal of a portion of the femur, and for partial amputation of the hand.

Points of Practice in Dressing.—The case of amputation to which I have referred leads me to notice two points of practice in respect to the dressing of wounds. In another similar case, I should suggest that, so long as there is no fœtor from the stump, no discharge, and no general symptom indicating the formation of pus, the part should not be touched nor interfered with in any way whatever for fourteen days. And, again, I would point out that should the surgeon feel it necessary to remove the dressing, he should scrupulously avoid the use of common water, either hot or cold. Water itself does not dissolve the styptic, and would only make trouble. The fluid to be used is a mixture of alcohol and ether, or equal parts of absolute alcohol and distilled water, warmed a little above the heat of the body.

Another point of practice worthy of note is simple but important. It is, that it is not good to leave the styptic in large quantities within a wound that is about to be closed for healing by the first intention. Thus left it combines with the blood in the wound, and forms a hard substance, which sometimes produces friction, and so causes evolution of heat and pain.

COMBINATIONS WITH THE STYPTIC COLLOID.—I have treated so far on the styptic fluid in its simple form. I should add, however, that as a base it combines well with the following medicinal substances, as you will see by the specimens now sent round:—

Creasote.—With the old creasote of the shops the fluid forms an excellent compound. The creasote acts well as an additional antiseptic, and also as a solidifier of albumen. It produces, however, some degree of irritation. The proportion is one minim of creasote to two drachms of solution.

Carbolic Acid.—With pure carbolic acid the fluid also combines. The compound so produced possesses the same properties as the mixture of creasote and the styptic. Five grains of the acid may be added to two drachms of the fluid. The combination is very powerful, but it produces some irritation.

Quina.—The pure alkaloid quina dissolves in the styptic fluid, and forms a good solution in the proportion of one grain to the drachm. The quina adds to the antiseptic power, but, I think, takes away from the adhesive property. Proportion, half a grain to a drachm.

Iodine.—Iodine unites readily with the fluid, and five, or even seven grains of it may be got into the quarter-ounce. The combination is most useful in cases where there is purulent or fœtid discharge from a surface surrounded with indurated tissue. The iodine produces no irritation.

Iodide of Cadmium.—Iodide of potassium and iodide of ammonium do not readily combine with the styptic; but iodide of cadmium, which possesses a similar physiological action, goes up in it readily. Half a drachm of the salt will go up in an ounce of the solution.

Bichloride of Mercury.—The bichloride of mercury is soluble in the solution, and the compound, in the proportion of the one-twentieth of a grain to one drachm of the styptic, is a most useful application in indolent syphilitic ulcers. I think this application would also be useful in lupus.

Morphia.—Morphia goes up well in the solution, and in irritable painful ulcer a compound of morphia and the styptic, in proportion of half a grain

of the alkaloid to a drachm of the fluid, is of service. Pain is at once relieved, and healing is promoted. This compound on cotton would be good for a stopping of a hollow tooth to relieve toothache.

All the other narcotic alkaloids in their pure form go up in the solution—atropia, aconitina, and the rest. I have, however, no experience as to the value of such combinations in practice. This experience has yet to be learned.

Cantharidine.—This substance, on the addition of a little chloroform, can be taken up in the solution. The compound produces what may almost be called a dry blister, the fluid secreted being taken up as it is exuded by the styptic. There are cases in which this blistering fluid would be a considerable advantage; indeed, it would probably, be an advantage in all cases in which a blister is required. Two to four grains may be used to the ounce.

Chloride of Zinc.—Chloride of zinc, which, in solution, has recently been used for the dressing even of recent wounds, makes a good compound with the styptic. Half a drachm of the salt dissolves readily in an ounce of the solution.

From these purely descriptive facts I pass to the subject of healing by the first intention.

ON HEALING BY THE FIRST INTENTION.—When a surgeon puts his knife through a living structure, he exposes not vessels only, not nerve only, not solids only, not blood only, but interstitial fluid, as it is proceeding for solidification.

Having exposed this fluid, he leaves a surface of it that has been exposed whenever he closes the wound; and this is the great point to remember, that healing by the first intention, or no such healing, turns precisely on the physical condition in which this fluid is thus left. If the wound be closely and well bound up before the fluid has had time to undergo change, then the fluid passes into solidification, becomes a bond of union of the divided parts, and sets up true healing by the first intention. But if the fluid has time to undergo change, to pass into one of the stages of its decomposition, then it does not solidify, and there is no true healing of a direct kind. Fresh fluid coming down presses before it the original fluid, and the process, as it is vulgarly called, of "healing from the bottom," is the natural sequence if the case goes well. It is astonishing how quickly, in some cases, the interstitial combining fluid undergoes change on exposure to the air. There is a physiological experiment which proves this very perfectly. You are aware that Liebig once advanced the view that in the natural state the blood is alkaline, but that the muscular juice is acid. This view was maintained for years. In 1854, when I was working daily in the slaughter-house, studying the coagulation of blood, I was led to test the reaction of the muscles both of oxen and of sheep while the muscles were still irritable, and to my tests the reaction was always like that of the blood, alkaline. Such, however, was my respect for Liebig, and such the force of what may be called the habit of belief, I actually distrusted my own work, and thought, after all, Liebig must be correct, and I somewhere in error. At length, and while I was still hesitating on the matter, Du Bois Raymond boldly and truthfully came out with an exposition of the error of Liebig, by showing that during life the interstitial fluid in muscles is alkaline like the blood, but that if muscle be exposed to the air for the shortest period, there is a change to acidity. The facts are so; they admit of direct proof on the living animal, and, if care be taken in its preservation, they can be proved, for a short time, on the dead muscle, say the heart of a dead animal. We will test the point here with the heart of a sheep. This heart has been removed two hours, but kept excluded from air. I cut open a surface, test it instantly, and find a feeble alkaline reaction. I lay open the surface for so short a time as three minutes, and, testing again, I find it acid. In half an hour the reaction everywhere will be strongly acid. If the other tissues of a living animal be divided and tested in the same manner, the same phenomena are observed.

In some cases this change is so active that from three to four minutes is sufficient to create it over the whole of the surface of a large wound. In other cases it is longer deferred: in a warm perfectly dry air it is deferred, in a very dry cold air it is deferred. It is quickened intensely by a warm moist air; it is quickened by an air charged with organic matter living or dead; and it seems as if there were peculiar conditions of the oxygen of the air, conditions of activity which also quicken it; a result quite natural, because the process is one of oxidation. Just as blood oxidises in the lung on its exposure to air, so this interstitial fluid oxidises when it is exposed to the atmospheric oxygen.

Suppose, then, the oxidation is established, what is the sequence? The sequence is disposition to further change. The fluid, modified in character, is no longer a fluid ready to enter into substance with the solid tissue with which it is in contact. It lies as foreign matter, preventing adhesion, and communicating acidity to the new plasma that is poured into it. From this state there may be three results:—

(*a*) The patient, being healthy and well provided with good plasma, and air, and specially water, being excluded from the wound, the new plasma may neutralise and throw off the old, and with some discharge there may be more or less of spaces in which there is healing by the first intention.

(*b*) The condition being less favourable, the changed plasma, acting as a foreign body, may excite the production of great heat in the part—inflammation so-called. In this state the plasma will sometimes be re-transformed into a plastic, coagulable fluid, which will form adhesions with partial healing and some production of pus. Or in this state all the fluid may be transformed into purulent fluid—abortive plasma, which will be alkaline but not adhesive, which will protect the parts shielded by it from external oxidation, and will allow the natural plasma to build up new tissue from beneath—healing from the bottom.

(*c*) There is one more major condition. The plasma, from becoming in the first place of acid reaction, may run rapidly into alkaline decomposition, with complete disorganisation of all the colloidal parts, the interstitial plasma, the effused blood, the fibroid membrane, the osteoid and tendinous gelatine. When this disintegration occurs the constituents of the plasma are transformed into new and soluble compounds, susceptible of re-absorption into the organism, and even of absorption into other organisms. During this form of degeneration, not during the purulent form as was once supposed, the systemic malady, misnamed pyæmia, finds its origin. These phases, which I have described from their physical side, you will all recognise, with shades of difference, as *bonâ fide* parts of practice and of practical observation.

Returning from these points to the treatment of an open wound, whether that be caused by accident or by operation, we are prepared to understand with precision many practical results to which we are blind so long as we are ignorant of the physics of the process of healing.

In the olden time, the chirurgeon, having no correct knowledge how to close a wound, and seeing bad results from bad closure, set his face against closing altogether, and, filling the wound with tar or pitch placed on tow, made it always heal, as he said, "from the bottom." In an age when there were no scientific principles to guide the surgeon, this practice was not bad; it prolonged the cure, certainly, but it saved the consequences of alkaline decomposition. The dressing, containing a good antiseptic—that is to say a powerful preventive of oxidation—allowed the new plasma to produce new tissue, and so there was healing. The surgery was rough, but, in the main, effective. It is still a sound practice in cases where a large surface or an abraded surface has been a long time exposed to air before coming under the hand of the surgeon.

In time came Sir Kenelm Digby with his sympathetic powder as the bait and his reversal of the old practice as the success. Rub the instrument that inflicted the wound every day with the powder—that was the bait; tie up the wounded part quickly, tie it up in its own coagulating blood, and do not meddle with it for fourteen days—that was the cure.

Various facts since the time of the sympathetic knight have proven the soundness of his practice apart from his superstition. There have been many practitioners who their lives through have acted on this plan in the extremest cases, and with the most surprising results. Mr. Adams, in one of his works, tells us of a surgeon who treated every case of compound fracture with perfect success by simply bandaging, closely saturating the bandage with compound tincture of benzoin, and leaving the rest.

In the battlefields of Egypt operations performed under canvas, in perfectly dry, heated air, in which all decomposition of albuminous matter is impossible—in which air, in fact, albumen itself dries into a horny covering—the process of rapid healing was a marvel to those who witnessed it.

But the crowning facts which bear on healing by the first intention are those connected with the practice of subcutaneous cutting. I cannot make out that any true case of pyæmia has ever occurred after neat subcutaneous operation. In fact, in the results of subcutaneous section we see absolutely how, in an open wound, the prevention of cure is caused by some external influence brought to bear upon the wound. Except for this experience and the lessons it brings us, we might dream of constitutional tendencies and such-like occult interferences with cure in open wounds; but the subcutaneous experience excludes them all.

The sum total of scientific fact lies, then, in this—that healing by the first intention is only prevented in any case by a change in the interstitial fluid which laves the tissues, and from which they are formed, the cause of this change being exposure to the combined influence of water and oxygen. With this understanding we learn the reason why some operations are more serious than others. The risk of opening serous cavities—for example, the peritoneum—is explained when we remember how larger a surface, covered with easily decomposable fluid, is exposed to the danger of decomposition when such a serous cavity is presented to the air. The peritoneum should never be opened except under special conditions. Thus:—

1. Let the operating chamber be small, and let few persons be present.
2. Let the temperature of the air be low—never above 55° Fahr.
3. Let the air be dry.
4. Let the air be rendered faintly alkaline by ammonia.
5. Let the operator have his hands protected with oil.
6. Let the operator be content not to put water or wet sponges into the cavity.
7. Let the operator forbid any hands except his own entering the cavity.
8. Let no ligatures hang out of the closed wound to admit either air or water.
9. Let the air in the cavity be carefully expelled as the wound is being closed.
10. Let the closing of the wound be so absolute that no action of the diaphragm or emptying of the viscera shall draw air afterwards into the cavity.

To secure healing by the first intention in ordinary wounds, it is necessary to treat an open recent wound immediately before closing it as follows:—

To remove from it all long ligatures.

To wash off the fluid with which it is covered, and then thoroughly to dry the surface, so that no water may be left to excite decomposition.

To bring every part into close contact, so that no moist air may be left behind, and when the lips of the wound are closed with suture, to seal up resolutely with a fluid which perfectly anneals structure, like the fluid I have here brought under notice.

To leave the wound in dry air; or, if that is not possible, to surround the parts with a simple substance, eager for water, but not caustic in its action. Such a substance I place before you in the form of washed and dried laminaria or sea-weed; a substance clean, light, and excellent as an absorbent of fluid coming from the body, or of water suspended in the surrounding air.

From the time of Sir Kenelm Digby until this hour, surgeons have fluctuated between the two extremes, of healing slowly "from the bottom," and of healing quickly through the mass "by the first intention."

I submit now that the time for this hesitation ought to be considered as over, and that the modern surgeon should neither hesitate, nor pause, nor tire, until he has made healing by the first intention a sure and certain portion of his art, and until he has lifted up that dark pall of surgical fever which the most eloquent of English surgeons tells us still enshrouds the most brilliant surgical exploits. I have aimed in the present lecture to give direction and solidity to this great work.—*Medical Times and Gazette, April* 13 *and* 20, 1867, *pp.* 383 *and* 409.

ORGANS OF CIRCULATION.

44.—NOTES ON THE PROGRESS OF ACUPRESSURE.

By Sir J. Y. Simpson, Bart., M. D., D. C. L., Professor of Medicine and Midwifery in the University of Edinburgh.

The great pathological and practical advantages which acupressure possesses over deligation have always appeared to me to be simple and decided. When an artery is closed by a needle, or by any other form of temporary metallic compression, the walls of the arterial tube are placed, and held together in apposition, by a material which does not tear their coats or irritate, like thread or silk, and that can be withdrawn in a day or two, at the will of the operator,—leaving subsequently no extraneous body whatever in the wound to prevent its speedy and complete healing. On the contrary, when deligation is employed—(1.) The two middle coats of the artery are systematically lacerated; and (2.) Its external coat is strangulated. (3.) This strangulation leads on inevitably to ulceration or molecular destruction of the external coat at the constricted part, and causes mortification of the artery at the tied point, and usually also below it,—just as a strangulating thread kills and removes a hemorrhoid, a polypus, or a wart. (4.) The small mortified point of the vessel becomes a dead and foreign body, and hence requires to be eliminated and thrown out of the living system by ulceration and suppuration,—so that there are as many dead sloughs, however minute, in each wound, and as many consequent points of ulceration and suppuration are set up—as there are arteries ligatured in the wound. (5.) Besides, the ligature-threads, if of silk or hemp, rapidly imbibe animal fluids, which speedily decompose in them; and then, the ligatures, like so many single thread setons, irritate the contiguous tissues; and at last they only become —more or less slowly—set free by ulcerating entirely through the strangulated portions of the tied vessels. (6.) Hence arises the difficulty, or indeed the impossibility, of wounds containing a series of ligatured arteries ever uniting completely by the first intention; for such wounds are in the same condition as if diminutive morsels of dead flesh had been methodically and intentionally affixed with threads to their sides and walls. But other dangers follow. (7.) No surgeon would deliberately leave a patient after the shock of amputation in the neighbourhood of a foul sewer, or where decomposing animal effluvia could be inhaled. But a wound containing a series of dead, decomposing, putrefying sloughs—however minute these foul sloughs are individually—places the patient in perilous hygienic conditions; for morbific septic poisons can be imbibed by the open and absorbing surfaces of wounds, as well as inhaled by the lungs. "A poison," sagaciously remarked the late Mr. Travers, "admitted by a wound or raw surface, and a poison admitted by the lungs, are equally excitants of a specific constitutional irritation.

Professor Pirrie, in a series of most important observations and cases, maintains (p. 137) that acupressure "is not only the *easiest* of application, but the *quickest* method yet devised for arresting bleeding;" and a pupil of Dr. Pirrie's—Dr. Will—last week informed me that the rapidity with which Dr. Pirrie secures the open vessels after amputation, &c., by acupressure is "something wonderful,"—the movements of his fingers not being easily followed by the eyes of the attendants.

In advocating the practice of acupressure, I have always claimed for it two advantages—viz.:

First, That it would yet be found the quickest and easiest mode of arresting surgical hemorrhage; and

Secondly, That its use, combined with the total absence of all surgical dressings, would *accelerate* the healing of wounds.

On the first of these points the evidence of Drs. Pirrie, Keith, and others, may now be looked upon as comparatively complete. But what of the other question—

Does it Accelerate the Healing of Wounds?—In his—the largest—portion of the conjoint treatise on Acupressure by himself and Dr. Keith, Professor Pirrie has described, with the most conscientious and scrupulous exactitude, all the special cases in which he used acupressure in capital operations; and I will try here to summarise the results obtained. To understand these RESULTS,—which are far more important than the mere facility and rapidity of the process,—let me first adduce the opinion which Dr. Pirrie holds as to what constitutes union by the first intention or by primary adhesion. In reference to this point Dr. Pirrie states: "The use of the ligature is attended with an insuperable obstacle to obtaining perfect examples either of immediate union or of union by primary adhesion without the formation of some pus. I have never allowed myself to call any case a perfect example of either of these two methods of healing where *a single drop of pus* was seen. Neither of these two methods of healing, in this sense, can be perfect in any case where the ligature is used. The immediate effects of the ligature—the changes by which its removal is rendered possible, and its presence acting as a seton in the wound—render more or less suppuration at the points of deligation and in the tracks of the ligatures inevitable. I never saw, in the experience of any surgeon or in my own, where the ligature was used, a perfect example of either of the two desirable methods of healing without any suppuration. I believe such a case NEVER *was and* NEVER *will be seen*." (p. 138.)

We see in this paragraph how strict Professor Pirrie's definition of union by the first intention is, he considering no case a perfect example of it where "*a single drop of pus*" is observable. Yet in the course of his work he has described above a dozen cases of large surgical wounds, consisting of amputation of the limbs, excision of the mamma, removal of tumours, &c., where perfect and entire union by the first intention was obtained under acupressure, metallic sutures, complete rest of the wounded part, and the avoidance of all dressings; and he relates a series of other cases where the results were highly satisfactory, though the primary healing was *not* thoroughly and entirely perfect, because a small amount of suppuration was seen.

Dr. Pirrie tells us (p. 66) that he has used acupressure in thirty-two cases where the "major operations" of surgery were performed, besides employing it in "many minor ones." In every instance (he adds) "its use has been *most* satisfactory." Out of these thirty-two major operations, which he has given in detail—including seven amputations of the thigh—fifteen cases, at least, healed entirely by the first intention, or *more than one in three*. Out of his first eight cases of acupressure, only one of the wounds was cured entirely by immediate union, and without a drop of pus. Out, however, of his last twenty-four cases, fourteen of the wounds were healed by the first intention, and without a drop of pus—*or more than one in two*—showing, as was to be naturally expected, that he became more successful in his results as he became more extensively and intimately acquainted with the practice of acupressure. To state these important facts in another form—

Among his first 8 cases 1 completely united—or 1 in 8.
Among his last 24 cases 14 completely united—above 1 in 2.

He had eight cases—among these thirty-two—of excision of the deceased mamma. In five of these eight cases the resulting mammary wounds closed at once, and without a single drop of pus.

Has any surgeon, living or dead, ever, in using deligation, met with such marvellous success as Dr. Pirrie has thus attained under the use of acupressure?

Could all the Hospitals of Great Britain, or of Europe, or of the World—if grouped and collected together—furnish within the same period of three years as great a number of cases of large *operative wounds, where the ligature was employed, healed entirely by the first intention, and without the appearance of "a single drop of pus," as the one little Hospital of Aberdeen?—Sir J. Y. Simpson's Pamphlet, p.* 10.

45.—NOTE ON ACUPRESSURE.

By Lawson Tait, Esq., Member of the Surgical Society of Ireland, &c.

[It is singular that as yet hardly any of the London surgeons have tried acupressure. At a meeting of the London Medical Society in November last, only Mr. Bryant had tried it, and his success had not been encouraging. Mr. Tait says:]

I have not used a ligature since 1860, I never carry them, and I cannot imagine any case in which the ligature would be required to supersede an acupressure needle. There never was any rational doubt "of the capability of acupressure to arrest hemorrhage" in the minds of those who had seen it fairly tried. Again, it requires no particular manipulative skill in its application—much less, indeed, than does the ligature; and this idea, which has been extensively promulgated by the objectors to acupressure, has I believe, done more harm by hindrance to its adoption than any other. I have had but a very slight experience of the ligature in my own hands; but I can affirm that it does not take me one-half of the time to secure the vessels of a stump by acupressure that I see others take to do the same with the ligature.

The other day, in a case of primary amputation below the knee, the time which I took to complete the operation, including the insertion of stitches, was observed by a bystander to be a few seconds under three minutes, and that without the presence of any trained assistant. There were four vessels to secure. I obviated the difficulty often experienced in this operation from the retraction of the posterior tibial, by the simple expedient of dividing the interosseous structures low down, immediately after the completion of the flaps, so that when the bones were divided the vessels had not retracted above the saw-cut. The needle securing the posterior tibial was marked. The patient was the victim of a railway accident, and, as the only available medical aid on the spot was unavailing to check the hemorrhage, and I had a long distance to go to him, he had lost a large quantity of blood before the operation. During the consequent delirium, about twelve hours after the operation, which was performed during shock, the marked needle was dragged out of its position by some unguarded corner of blanket. Not a drop of blood followed—indeed, the attendants did not think it worth their while to awaken me on its account.

Eighteen hours after the operation I put the patient in a carriage and conveyed him a distance of twenty-two miles, to be within easy access of efficient medical attendance. I had the stump on my knee throughout the journey, and although I felt rather uncomfortable when I observed reaction set in, yet I had sufficient confidence to deter me from any unnecessary interference. The result was that on the thirteenth day the stump was completely united by first intention, save at the inner corner of the wound, where a few shreds of inter-muscular septa were sloughing. Not a drop of blood was lost at any time after the operation.

On the twentieth day he shivered, and rapidly he came pyæmic, and died with symptoms of abscess in the left hemisphere of the brain.

On examining the stump it was found that the union had for the greater part been undone, but that what still remained was very firm. All the vessels were closed in a thoroughly efficient manner. The ends of the bones were covered with firm, healthy granulations.

I do not record this case with any intention of recommending that any needle should be removed so early as the twelfth hour. Besides being quite

unnecessary, such practice would in many cases be very unsafe; but it shows how very little is really required to close a vessel. During the past few months I have had several serious operations, requiring the use of acupressure, and in all I have found it quite successful.—*Medical Times and Gazette, March* 30, 1867, *p.* 332.

46.—ON ACUPRESSURE AS APPLIED TO "STREET SURGERY."

By Dr. James Dunlop, Glasgow.

[Dr. Dunlop is police-surgeon to Glasgow, south of the Clyde, and has from this appointment as much minor surgery as occurs in a small hospital. During three years he has had 404 cases of wounds or other injuries. One of his chief annoyances for many years has been the necessity of dressing wounds over again, owing to secondary hemorrhage occurring. He says:]

During the last three or four years I have been using the needles, in all kinds of wounds, I do not remember a single instance in which I have been sent for to re-dress a wound in which bleeding had returned. No matter how excited and how violent the patient may be in his cell, he never yet has succeeded in removing the needles, or unloosing the threads which were around them. I am thus saved a great deal of time and labour, for which I feel duly thankful to Sir J. Y. Simpson. There is, besides, no shaving of scalp required, for there is no need of a smooth surface, as no plaster is applied to keep the edges of the wound together.

Such a wound on the scalp as I have described is now managed thus. The clots which have burrowed under the scalp are first turned out, and the wound then thoroughly washed; the blood is washed out of the hair, and the full extent of the injury is then in view. Having removed any dirt or hairs which may be adherent to the wound, a glover's needle, of a size a little larger than the extent of the wound, is applied in the following manner. In order to make the matter quite clear, it may be well to divide the procedure into three steps. In the first, the needle is taken and made to penetrate the skin at a point on a level with the lower angle of the wound, and almost a quarter of an inch from the edge of one lip of the wound. The needle is then pushed along the under or raw surface of the lip, till the upper angle is reached, when the point of the needle is made to appear through the skin at the proper level and distance from the raw edge. This step is the first method of Simpson.

In the second step, an ordinary linen thread is taken, and a few turns of it, in figure of 8, from eye end to point, are made round the needle. All the bleeding vessels, veins, and arteries along the one side of the wound are compressed by the needle against the tissues and the thread above. A second needle, similar to the first, is applied along the outer lip of the wound, and a thread in figure of 8 around it. The second needle and thread compresses all the bleeding vessels on the other lip of the wound. In the third step, the edges of the wound, from which there is now no bleeding, are brought together, and kept in apposition, by a few turns of thread, from the eye end of the one needle on the one side to the point of the other needle on the other side, and *vice versa*. The hair is then brought over the wound, and the dressing is complete, and no risk whatever is run of any further bleeding from the wound. On the following morning, ten or twelve hours afterwards, the needles are removed, and the thread left as a covering to the wound, which heals up, with or without the formation of pus, according to the amount of bruising or tearing of the part.

I prefer thread to wire in scalp wounds, as it is cheaper, more easily handled, and when the needles are removed it serves as a dressing by scab to the wound.

It may be mentioned that it is sometimes difficult to take out the needle, and that a forceps may be required if the scalp is thick and tough. If, however, the needle is left in the scalp for twenty-four or thirty-six hours, the difficulty is greatly diminished, and, if left long enough, the needle will come

out of itself. As in most scalp wounds from falls there is considerable bruising and tearing of the skin, healing by first intention, without pus, is not very common; but in clean cut wounds, in which the bleeding has been arrested by needles, and the edges kept in apposition, as above described, immediate union, as a rule, takes place. And the presence of a needle in the wound, from the short time it is allowed to remain, does not become a source of local irritation, or an impediment to the healing process.

All scalp wounds, in which bleeding is at all profuse, and when, from the condition of the patient, any more simple treatment, as knotting the hair over the wound, would be equivalent to doing nothing at all, are now treated by me in their first stage with needles. I have sometimes used two or three dozen of needles in a week, and have never yet seen any erysipelas or other bad effects from transfixing wounds of the scalp with them.

Wounds in the face or forehead from blows or falls are of frequent occurrence. Sometimes they are large and gaping, and over the eyebrow, or upon the prominence of the forehead. When in the latter position, and the bleeding profuse, I have in many instances passed a needle under the temporal artery at a little distance from the wound (Simpson's first method), and with a few turns of thread from point to eye end of needle, compressed the artery and at once arrested the bleeding. The wound was then dressed with a few strips of adhesive or isinglass plaster. After eight or twelve hours the needle was removed—no bleeding recurred, and no mark was usually left by the needle, and often little by the wound.

As an illustration of the value of acupressure in wounds about the forehead, the following case may be quoted:—

An old man, a weaver by trade, came into the city from the country, a distance of eight or nine miles. While in town he became intoxicated, and, as he was proceeding homewards, he fell out of the cart, in which he had been getting a friendly drive. When taken to the waiting-room of the police chambers he was found to have a large wound over the left temple, from which the bleeding had been so very profuse that the old man became weak and faint, and had to be laid upon his back.

The wound was dressed with plaster, and with a compress over it. The bleeding appeared to be checked. But, after a little time, he rallied from his fainting state, and the wound began to bleed afresh. As the cart was waiting to convey the man away, a needle was introduced under the temporal artery, at a distance from the wound, and a thread passed round it. The bleeding was at once arrested. The man was thereafter assisted into the cart, and the driver received instructions that, on his arrival home, the doctor was to be sent for, and the needle removed. Without the needle, to command the bleeding from the divided artery, I would not have permitted the removal of the old man, as, in his intoxicated condition, weak from blood already lost, any further bleeding, occurring while in the cart and at a distance from home, might have been attended with fatal results. With the temporal compressed between the needle and thread, there was not the slightest risk of further hemorrhage, and the vessel was more secure than if the finger of the surgeon had accompanied the patient.

On two occasions I have had to pass a needle under the facial artery as it crosses over the lower jaw, to arrest troublesome bleeding, in deep gashes in the cheek, inflicted in one instance, in the case of a sailor, by a blow with a broken bottle; in the other by a fall from the top of an omnibus among street rubbish.

In the former the needle was removed after the lapse of four hours, and the wound, which was dressed with plaster, healed up very nicely, leaving little mark. In the latter, though the bleeding was satisfactorily arrested by the needle which was removed twelve hours afterwards, from the amount and depth of the laceration of the tissues, the wound only healed up after considerable suppuration.

In the great majority of wounds on eyebrows, forehead, or chin, from which there is little bleeding, a fine needle passed from one edge of the wound to the other, as in the "Hare-lip operation," only obliquely instead of

straight across, and with a few turns of thread from eye end to point, the bleeding is arrested, and the edges of the wound are kept innice apposition without the intervention of plaster or any other dressing. In cases of wounds on the face or forehead, in boys or girls, in whom it is of the utmost importance that no mark be left, the keeping of the edges in apposition in the manner just described will be found to give more satisfactory results than when they are treated with wire sutures or thread stitches.

In one case only have I had occasion to arrest bleeding by acupressure in a wound of the abdomen. This case was that of a lad who had been stabbed in the lower part of the belly in a scuffle. The knife had divided the epigastric artery, and the bleeding from the wound was profuse. A needle was passed into the wound, under what was thought might be the bleeding vessel, the point being brought up through the skin and the inner side of the artery. A few turns of the thread compressed all the tissues between the needle and the skin, and the bleeding was immediately arrested. Next morning the needle was removed, the bleeding did not return, and the wound did not heal by first intention, but in the usual way that stabs with blunt knives in the abdomen usually do.

Two more illustrations of the application of the needle in arresting hemorrhage may be given. There was the case of an old woman who pushed her left hand through a pane of glass, inflicting a wound in the wrist about an inch and a half above the root of the thumb, which divided the radial artery completely. A needle was inserted under the vessel, immediately above the wound, and a thread passed round from point to eye end, in figure of 8 form. The edges of the wound were brought together, and a compress and roller applied. Next morning the needle was removed, but the pad was not touched for several days. When it was removed the wound was whole.

The other illustration which may be given was the case of a child about ten days old, from whose umbilicus there occurred bleeding which resisted the application of caustic, a graduated compress and roller, and was only arrested after a needle was made to transfix the vessels and skin around the navel, and a ligature applied under the needle. This method, however, of treating bleeding at the umbilicus of a child, is one with which surgeons have long been familiar, and is the same in principle as the plan adopted in keeping a ligature on a vessel where the tissues are soft and the thread will not hold.

The only mishap which has occurred in my experience from the application of needles in wounds presented itself about six months ago, in the form of a traumatic aneurism, the vessel having been injured in the passage of the needle. The case was that of an elderly man, who fell down a stair, inflicting a deep gash on the back of the head, from which there was profuse bleeding. Needles were applied to the edges of the wound, which arrested the bleeding, and thereafter water dressings. Two days after the accident the needles were removed, and in ten days the wound was nearly whole, except at the upper angle, where there was observed a small pulsating swelling, half the size of a walnut. To show this swelling the man had returned to town. During the healing of the wound, he stated that at times it often "took a bleeding," and that he had to get his head tightly bandaged before the flow could be arrested. As this pulsating tumour was upon one of the posterior occipital arteries, a needle was passed readily under the vessel, about an inch from the tumour, and a thread turned in figure of 8 form from point to eye.

In two days the tumour had disappeared, and did not return when the needle was removed. In a few days more the wound was entirely whole.

In conclusion, I would recommend surgeons who have opportunities of treating superficial wounds, to give a trial to Simpson's acupressure, as I feel assured that it is not only the most simple and expeditious, but the most effectual method of arresting bleeding, and of putting wounds into the best position for healing that we have. For wounds of the scalp, or where the skin is tough, a spear-pointed glover's needle is better than the pin with the glass head, recommended to be employed in major operations: for unless the pin is retained for twenty-four or thirty hours, the forceps will be required to withdraw it, and the glass head, instead of an improvement, would be

found a disadvantage. On the removal of the needle the thread is to be left to form a scab, and if there is a probability of suppuration ensuing in the wound, the thread may be wet repeatedly with a mixture of carbolic acid and glycerine, as practised in the Infirmary by Professor Lister, in the conversion of compound fractures into simple ones by the exclusion of the air, by the prevention of the formation of pus, and by the promotion of union of the lips of the wound by first intention.—*Glasgow Medical Journal, April*, 1867, *p.* 476.

47.—ON A CASE OF POPLITEAL ANEURISM TREATED BY TEMPORARY METALLIC COMPRESSION OF THE FEMORAL ARTERY.

By T. Pridgin Teale, Jun., Esq., A. M., Oxon.

[The treatment of the following case was suggested by a case of carotid aneurism successfully treated by Dr. John Dix, of Hull. (See Medical Times and Gazette, Dec. 30, 1865, p. 717.) In Mr. Dix's case a temporary wire compress was applied, and withdrawn on the sixth day, as soon as the aneurism had become solid, and all pulsation ceased.]

Frederick W., a collier, aged 34, was admitted into the Leeds Infirmary on December 29th, 1865. In the right ham there was a pulsating tumour, of the size of a small orange, very soft (especially on the inner side), and without any evidence of consolidation of its contents. He suffered also from severe neuralgic pains in the leg. He first noticed the tumour two weeks before admission, but he had been for three months laid up with rheumatism, brought on by working, a whole day in wet clothes. The rheumatism affected all his joints, and had disabled him during the whole three months, with the exception of one week. The only history of accident was, that four years ago he fell down a cellar when drunk and sprained the right knee, returning to his work in a fortnight, not any worse for the accident.

Treatment by Flexion.—Dec. 30th. The ankle was firmly bound to the thigh until the pulsation in the tumour became almost imperceptible. During the rest of the day the neuralgic pains in the leg were considerably relieved.

Jan. 2nd, 1866 (fourth day of flexion). The leg was unbound, in order to ascertain whether any improvement was taking place in the aneurism, and to relieve him from the discomfort of the constrained position. There was no sign of consolidation. Flexion was resumed in the evening.

4th (sixth day.) Treatment by flexion was abandoned, as there was no appearance of improvement, and the circumference of the knee had increased from 16½ in. to 16⅞ in. The pulsation was quite as distinct as before the employment of flexion.

Treatment by Wire-compress (First period.)—Jan. 4th. The femoral artery having been reached in the usual way, at the apex of Scarpa's triangle, a silver wire was passed behind the vessel, instead of the ordinary ligature of silk or hemp. Each end of the wire was then threaded on a needle, and by this means carried obliquely outwards through the sartorius until it was brought out through the skin at the distance of an inch and a half from the wound. The two ends of the wire, being about one-third of an inch apart, were then tied over a small piece of cork, and were tightened so as to compress the artery, and stop the pulsation of the aneurism. Thus the wire formed a bridle passing from the skin round the artery, which could be made tight or slack at pleasure, and could eventually be withdrawn when no longer needed for compressing the artery. The pulsation of the aneurism having been completely arrested, the wire was fixed over the cork, and the wound was closed by wire sutures. The operation was followed by great diminution of the neuralgia of the leg.

Second day. Slight pulsation in the aneurism.

Third day. Pulsation arrested by the insertion of a small wedge between the wire and the cork, as practised by Mr. Dix in his case.

Fifth day. Slight pulsation, arrested by additional wedges. Circumference reduced from 16½ in. (day of operation) to 16⅜ in. No consolidation.

Sixth day. Pulsation of tumour doubtful.

Eighth day. The wedges were removed, and the wire untied, so as to take off all compression of the artery.

At this period, he had become restless and feverish, and appeared distressed by the pressure of the cork upon the skin; so that, although there was a faint pulsation in the tumour, I felt compelled to give him at least temporary relief from the pressure. The wound by which the artery had been reached had healed by first intention.

Treatment by Wire-compress (Second period.)—Tenth day. He was much relieved by the remission of the compression for forty-eight hours, being less feverish and restless. The pulsation in the tumour, however, returned, and was increasing, though it had not become so great as before the compression was commenced. To enable him to bear the pressure upon the skin, which when concentrated upon the small piece of cork had much distressed him, I fastened the wire round a piece of splint, 5 inches by 1 inch, in order to distribute more extensively the pressure over the skin. This change answered perfectly. Especial care was taken to arrest the flow of blood through the artery completely.

Eleventh day. Suspicion of a thrill in the tumour. Wedge added. He bears the diffused pressure of the splint without discomfort, and is improving in condition.

Thirteenth day. Slight thrill. Second wedge added.

Fourteenth day. Wedges removed, so as to relax the compression.

Period after Removal of the Wire-compress.—Fifteenth day. Wire untied. Circumference of knee reduced from 16½ in. on the day of operation to 16 in. Pulsation not perceptible. Tumour rather more solid.

Sixteenth day. No pulsation. Wire withdrawn.

Eighteenth day. Solidity of the tumour more decided; circumference reduced to 15¾ in. Pulsation of femoral ceases at the origin of the profunda, 1½ in. above the place of incision. There is a red blush round the openings whence the wire compress and the wire sutures have been removed.

Twenty-second day. Rigors; intense headache; feverishness.

Twenty-third day. Erysipelatous blush about the newly-united wound and the wire openings.

Twenty-eighth day. Erysipelas has spread down the thigh and half-way down the leg.

Fifth week. Œdema of leg and foot. He is very ill. Large abscess forming in the calf.

Sixth week. Repeated rigors. Abscess opened. More abscesses about the knee.

Seventh week. Hemorrhage from calf.

Eighth week. Hemorrhage.

Eleventh week (from commencement).—Death.

Examination after Death.—The wound leading to the artery was perfectly healed. The femoral artery at the seat of compression was cut through, the divided ends not being retracted, but held together by their adhesions to the sheath, which appeared to bridge over and render secure the short interval. The artery above the point of division was much reduced in size, and did not contain any plug of lymph; below this point it was narrower, and plugged by a long clot. The divided ends of the artery were perfectly closed. The femoral vein below the seat of operation was filled by a recent clot, not adherent. The abscesses in the calf communicated with the cavity of the aneurism, which had evidently become diffused. This probably explains the repeated hemorrhages from the abscesses in the calf.

Conclusions.—1. That in cases in which arrest of the arterial current produces rapid consolidation of the aneurism, and the wire can be withdrawn in from three to five or six days, this method of Mr. Dix is superior to ligature.

2. That in cases in which consolidation is deferred, and the compression has to be continued beyond five or six days, the wire will cut through the artery equally with the ordinary ligature, the same protective changes taking

place in the divided ends of the vessel. In such cases this method is neither inferior nor superior to the ligature, as far as artery and aneurism are concerned.

3. That in using the wire compress, in aneurism of the extremities, all circulation through the aneurism ought to be cut off from the first.

4. That it is a question, to be settled by further experience, how far the concentrated compression by the cork on the skin is injurious, by distressing the patient and inducing a feverish condition, interrupting thereby healthy plastic processes, and predisposing the patient to erysipelas and pyæmia.

5. That in any future case I should diffuse the counter-pressure over as large a surface of skin as possible, to enable the patient to bear it without discomfort.

In the first period of the treatment by compression I was less careful to arrest entirely the pulsation of the aneurism, under the impression that a feeble current favoured the deposition of fibrin on the walls of the cavity. The question forces itself upon me whether this patient might not have recovered under the usual method of ligature. Harm, I think, was done in two ways. First, the week spent in trying flexion, not only lost valuable time, but gave rise to discomfort and a slightly febrile condition, which was unfavourable for after treatment. Secondly, I cannot but think that the painful, long-continued pressure upon the small area of skin contributed in some measure to the attack of erysipelas. These two disadvantages apart, and they can be avoided in future, I believe that a patient treated by the wire compress, if consolidation of the aneurism be delayed, is still in no worse condition than one who has undergone ligature of the artery; but if consolidation follows rapidly after the application of the compress, that he is safe from all the dangers which accompany the slow separation of the ligature.—*Lancet, Jan.* 5, 1867, *p.* 3.

48.—NOVEL METHOD OF DEALING WITH LIGATURES APPLIED TO ARTERIES.

Mr. Campbell De Morgan has been adopting of late, at the Middlesex Hospital, a plan of dealing with ligatures applied to vessels during a cutting operation, which merits notice. When the vessels have been tied, instead of following the usual custom and leaving the ligatures hanging out of the wound, Mr. De Morgan, by means of a needle, passes them through the skin close to where they are tied. They remain quite quiet, and come away without the slightest pain or trouble when their work is done. The wound consequently has nothing to irritate it, and enjoys every opportunity of healing by the first intention. The plan leaves the parts as quiet as if acupressure had been applied. There is now in the hospital a case in which Mr. Moore tried the method at Mr. De Morgan's suggestion, on Wednesday week, after removing a breast.—*Lancet, Jan.* 19, 1867, *p.* 82.

49.—TRAUMATIC ANEURISM ON THE PALM CURED BY COMPRESSION.

Under the care of Sidney Jones, Esq., St. Thomas's Hospital.

[The following case furnishes a good example of success attending carefully-managed compression in the treatment of traumatic aneurism.]

Rebecca L., aged 29, married, was admitted into the hospital on the 21st of June, 1866. On the 19th of the previous May, whilst opening a window, the sash of which gave way, she received a glass wound just below the front of the base of the right radius. The wound in the skin was transverse, and about three-quarters of an inch in extent. From it the patient herself drew a narrow-pointed blade of glass, which had passed obliquely for a distance of

nearly two inches towards the inner side of the palm. It had apparently gone through the annular ligament, and had wounded the dorsal side of the ulnar artery in its course to form the superficial palmar arch. At the time there was very extensive hemorrhage, at first controlled with difficulty, but subsequently completely so by a pad firmly applied over the wound and forced flexion of the forearm. The wound was completely healed in about ten days. Mr. Sidney Jones saw her on the 18th of June, four weeks after the injury. There was then a scar, three-quarters of an inch in extent, above the wrist. On the outer side of the ball of the little finger there was a pulsating swelling about the size of a large walnut. The skin was thin, and the surface red and shining. Much pain was complained of in the palm, and along the ring and little fingers. The movement of these fingers was also much impaired. On pressure the sac was readily emptied; and the thumb might be passed without difficulty deeply into the palm and beneath the annular ligament. Pressure on the ulnar above the wrist diminished, but did not completely control, the pulsation; when combined with pressure on the radial, all pulsation was arrested. Pressure on the brachial likewise arrested all pulsation. Forced flexion of the elbow did not seem to have sufficient control over the pulsation to induce one to trust to this treatment alone.

By means of a tourniquet light pressure was kept on the brachial. A bandage was applied from the hand upwards, and cork pads were placed upon the radial and ulnar above the wrist. At the same time the forearm was flexed. At first, on account of the tension and redness of the skin over the aneurism, it was thought unadvisable to use any pressure in the palm; but subsequently, when the redness had subsided, and the sac had become somewhat consolidated, a cork pad was placed also over the site of the aneurism.

Two days after her admission the treatment was interfered with, in consequence of her having to leave the hospital on account of the death of her husband. She returned on the 29th of June, and treatment was resumed on the 30th.

July 7th. No pulsation to be felt in the sac on removal of all pressure; sac consolidated and much diminished in size; slight œdema of hand. The tourniquet was then discontinued, but pads were kept on the radial and ulnar, as well as over the sac.

Pulsation did not return during her stay in the hospital, which she left on July 13th. About a fortnight afterwards, a slight return of pulsation occurred from use of the hand, but soon disappeared. To continue the pads until all the palmar swelling had subsided, and to keep the arm completely at rest. The bandage was worn until November.

Jan. 8th, 1867. No trace of aneurism to be discovered; the movements of the fingers not in the least degree impaired.—*Lancet, Jan.* 26, 1867, *p.* 116.

50.—NEW OPERATION FOR CURE OF VARICOSE VEINS.

Case under the care of JOHN WOOD, Esq., at King's College Hospital.

A man was operated on for varicose veins of the right leg, by Mr. Wood, by a new method, which consists in including the dilated vein between a needle in front and a double metallic wire behind. The needle and wire are introduced through the same openings, the latter first, and it is twisted as tightly as possible round the two projecting ends of the needle. Within two or three days, the wire works its way through the vessel. If by that time it have not done so through a piece of fascia intervening, it may be untwisted and tightened again. In this instance the vein was operated on in two different places, at an interval of about an inch. Mr. Wood stated that all the cases which he had treated by this method had done well; he had never had to deal with troublesome sores, and in one case only had there been a small abscess in a man in a low state of health; while he considered that it was a great point in favour of his mode of operating that it was not attended with

any risk of hemorrhage, an accident which he has known to occur after Mr. Lee's operation for varicose veins, in which the vein is divided between two ligatures. He added, however, that where there was a mass of dilated veins, as in the scrotum for instance, Mr. Lee's method was preferable to his own.—*British Medical Journal, Jan.* 19, 1867, *p.* 55.

ALIMENTARY CANAL.

51.—STRANGULATED CONGENITAL INGUINAL HERNIA.

Case under the care of Prescott Hewett, Esq., at St. George's Hospital.

The interest of the following case lies especially in the anatomical formation of the hernia. It was a good example of rupture into the vaginal process of the peritoneum—a form which it is important to distinguish from the ordinary kind of inguino-scrotal hernia. As will be seen, the occurrence of the hernia was characteristically sudden. A young man, previously healthy, finds after exertion a tumour in his scrotum. There is no gradual process of development, such as is observed in the ordinary inguino-scrotal rupture.

Mr. Birkett, in the article "Hernia" (Holmes's System of Surgery), remarks of these cases that the "tumour projects in a remarkable manner from the external outlet of the inguinal canal: directly the rupture escapes from the embrace of the external abdominal ring, the form is more globular and rounded in comparison with the pyriform outline of the hernia of slow formation in adult life." In the case before us Mr. Hewett lost no time in operating. He remarked that in these instances the stricture is so tight that severe mischief is occasioned with more than usual rapidity, unless the gut be quickly liberated. It is worth noticing, that the taxis is much less frequently successful in these cases than in the ordinary inguino-scrotal hernia in which the sac is slowly formed. Mr. Birkett shows that of 57 cases collected at Guy's Hospital in which a cutting operation was required to liberate a strangulated hernia, 33 belonged to the class of which we are writing, and 24 were of the old slowly-forming variety. Again: of 129 cases of oblique inguinal hernia, 59 had traversed the canal of the vaginal process of the peritoneum, and 70 belonged to the old inguino-scrotal variety. Of the former kind, 33 per cent. required a cutting operation; of the latter, but 24 per cent.—*Lancet, Dec.* 1, 1866, *p.* 604.

ORGANS OF URINE AND GENERATION.

52.—THE PROOFS THAT LITHOTRITY IS AN EMINENTLY SUCCESSFUL OPERATION.

By Henry Thompson, Esq., Surgeon Extraordinary to H. M. the King of the Belgians, and Surgeon to University College Hospital.

In the Lancet of Feb. 17th, 1866, and of Feb. 25th, 1865, I published as proof of the capabilities of lithotrity a statement of every case in which I had crushed a stone during the years 1864 and 1865, amounting in number to forty-three. I now present another year's entire experience of lithotrity—viz., that in 1866, amounting to twenty-seven cases more; and I venture to assert that this series of seventy consecutive cases completely supports the proposition placed at the head of this paper. I shall briefly report each one of these cases, and follow the system previously adopted, of naming at least one individual whose name is known, and who has seen the case as well as myself.

Case 1.—A gentleman aged 69. Very large phosphatic stone. Eight sittings: Dec. 1865, Jan. 1866. Perfectly successful. Seen with me by Mr. W. Morris, of Petworth.

Case 2.—A gentleman aged 56. Two rather small uric-acid stones. Five sittings: Dec. 1865, Jan. 1866. Perfectly successful. Seen also by his medical man, Mr. W. Morris.

Case 3.—A gentleman aged 65. Several hard phosphatic stones; severe disease of bladder. Five sittings: Jan. 1866. Perfectly successful. Seen with me by Mr. M. Foster, of Huntingdon.

Case 4.—A gentleman aged 53. Stones uric-acid and phosphatic mixed. Eight sittings. Disease of bladder, and tendency to produce phosphatic matter subsequently for some months. Finally cured, and now in a state of comfort. Jan. and Feb. 1866. Sent to me by the late Dr. Brinton, and known to Dr. Phillips, of Coventry.

Case 5.—A gentleman aged 67. Rather small uric-acid stone. Three sittings: Jan. 1866. Perfectly successful. Known to Mr. C. S. Webber. At this and all the foregoing cases Dr. Mazanowski, of St. Petersburg, was also present.

Case 6.—A gentleman aged 67. Large medium-size uric-acid stone. Nine sittings: January and February, 1866. Perfectly successful. This case was seen with me throughout by Mr. John Foster, of Upper Wimpole-street.

Case 7.—A gentleman aged 66. Small uric-acid stone. Two sittings: January, 1866. Extreme fever following, from which he made a perfect recovery. He was seen throughout by his medical attendant, Dr. Monckton, of Maidstone.

Case 8.—A gentleman aged 72. Large phosphatic stone. Six sittings: February, 1866. Perfectly successful. Seen with me by Mr. Charles Butler, of Ingatestone.

Case 9.—A gentleman aged 63. Medium-sized uric-acid stone. Five sittings: February, 1866. Perfectly successful. Seen by Dr. Charles Mayo and Dr. Taylor, of Guildford.

Case 10.—A gentleman aged 69, with very advanced disease of the bladder and enormously enlarged prostate; but he was suffering so severely from several hard phosphatic stones, and with exhaustion therefrom, that I could not decline to make an attempt to remove them, notwithstanding his very unpromising condition. He gradually sank from debility. Seen throughout by Mr. W. S. Foster, of Newport.

Case 11.—A gentleman aged 74. Large uric-acid calculus. Six sittings, chiefly under the influence of chloroform, and much débris removed: March, 1866. Perfectly successful. Has hunted regularly this present season. He was seen by Mr. Clover, who gave chloroform several times.

Case 12.—A gentleman aged 56. Rather small uric-acid stone. Four sittings: March and April, 1866. Perfectly successful. Attended throughout by Mr. John Foster, of Upper Wimpole-street.

Case 13.—A gentleman aged 70. Several uric-acid stones. Six sittings: March and April, 1866. Perfectly successful. Seen with me by Dr. Radcliffe.

Case 14.—A gentleman aged 48. Phosphatic stone. Four sittings: March and April, 1866. Perfectly successful. The patient was seen with me by Dr. Hudson, of Cork-street.

Case 15.—A gentleman aged 67.—Rather small uric-acid calculus. Four sittings: April, 1866. Perfectly successful. Seen with me by Dr. Owen Rees.

Case 16.—T. H., aged 49. University College Hospital. Two rather large uric-acid stones. Eight sittings: May and June, 1866. Perfectly successful.

Case 17.—D. E., aged 39. University College Hospital. A large uric-acid stone. Seven sittings: June and July, 1866. Perfectly successful.

Case 18.—A gentleman aged 73, with a very large and hard uric-acid stone. He was very much averse to lithotomy, which would perhaps have been the better operation for him, and I consented to crush the stone. It turned out to be even a little larger than I anticipated. It was entirely removed in several sittings, but he succumbed to fever and exhaustion. June and July, 1866.

Case 19.—A gentleman aged 67. A medium-sized phosphatic stone. Renal disease existed; œdema of the legs; and advanced disease of the bladder. There was complete phimosis. The urethra was blocked with phosphatic débris, and the urine dribbled off involuntarily. I operated first on the urethra, and cleared it; then crushed the stone, in five sittings, with perfect success. All his other symptoms have been greatly relieved since, and he has no trouble whatever now with the bladder or urethra. May and June, 1866. Seen with me by Mr. P. C. Chadwick, of Wrington.

Case 20.—A gentleman aged 70. Five or six small uric-acid stones. Six sittings: June and July, 1866. Perfectly successful. Mr. Swain, of Devonport, was present at one sitting.

Case 21.—A gentleman aged 55. Medium-sized hard phosphatic stone. Five sittings: July, 1866. Perfectly successful. Attended throughout by Mr. John Foster, of Upper Wimpole-street.

Case 22.—W. M., aged 40. University College Hospital. A man with advanced renal disease, whose symptoms were aggravated by the presence of two or three phosphatic calculi in the bladder. These were removed in three sittings, in July, 1866; and he left the hospital with his bladder free from calculous matter, and was so far relieved. He fell a victim to the organic disease of the kidneys ultimately.

Case 23.—R. W., aged 52. University College Hospital. Enormously large and hard phosphatic stone. Fifteen sittings: Oct. and Nov., 1866. Perfectly successful. He had been the subject of lithotomy before.

Case 24.—A gentleman aged 76. Two uric-acid calculi of small medium size. Five sittings: Oct. and Nov., 1866. Perfectly successful. Was also under the care of Mr. Blaker, of Brighton.

Case 25.—R. E., aged 60. University College Hospital. Mixed uric-acid and phosphates. Four sittings: Nov., 1866. Perfectly successful.

Case 26.—A gentleman aged 54. Medium-sized uric-acid stone. Five sittings: Nov. and Dec., 1866. Perfectly successful. Was also under the care of Dr. Lionel Beale.

Case 27.—A gentleman aged 75. Large uric-acid stone. Six sittings under chloroform: Dec. 1866. Perfectly successful. Was seen with me throughout by Dr. F. Davies, of Gower-street.

[The following is an analysis of twenty-seven cases of stone in the bladder operated upon by lithotrity during the year 1866.]

The oldest patient of the series had passed seventy-six years of age; the youngest was thirty-nine years; four only were below fifty years of age; thirteen had a mean age of more than seventy years; six were above seventy-two years of age. The mean age of the entire twenty-seven cases is upwards of sixty-two years.

Taking the seventy consecutive cases I have operated upon by lithotrity in three years, it is very remarkable that the same mean age held good for each year, and consequently remains the same for the total number—that is to say, the mean age of the seventy individuals so operated upon is a little more than sixty-two years.

There were two deaths in the past year; there were two in the preceding two years, making four altogether; and I reckoned among these, as one death, a case by no means necessarily resulting from lithotrity. The worst construction, then, is at once accepted in order to meet any suspicion of an endeavour to make the case for lithotrity better than the facts actually warrant. I must add, in fairness to this question and also to myself, that many of these patients were in circumstances of health which rendered interference very hazardous. The greatest care and very attentive watching were necessary to such patients. I have not selected cases; for, on the contrary, many of the worst and most difficult to deal with have been attracted by the success of the operation, especially during the last year, which has furnished me with a class of patients much below the average in health and stamina.

In no case have I declined to employ lithotrity, unless an old and narrow stricture (in one case), or an exceedingly large and hard stone, has rendered crushing impossible.

Cases of atony of the bladder (erroneously called paralysis), of greatly hypertrophied prostate, and of chronic renal and vesical disease, were of frequent occurrence among the series. I suppose it would not be possible to collect in three years seventy individuals of sixty-two years of age suffering from stone in the bladder without finding much chronic disease among them.

I have now, therefore, no hesitation in claiming to have established the following propositions:—

1. That lithotrity is capable of freeing elderly patients from stone at a very small risk, if well-constructed instruments, with delicate manipulation, be employed, and if watchful care be exercised in the management of the patient.

2. That the success of lithotomy has never been in any way comparable with that which I have been able to report as the result of the crushing operation.

Relative to the mode of operating I have little to add. The lithotrites employed have almost invariably been those made by Messrs. Weiss, and fitted therefore with their most ingenious mode of changing sliding into screw action, and *vice versâ*; and also with the cylindrical handle designed by myself, which permits of the most delicate movement, as well as of the utmost solidity of grasp.

I have never once used a preliminary injection. Mr. Clover's instrument for removing fragments was employed occasionally, only where it seemed to be wanted; by far the greater number of cases with me do not require it, but now and then it is very useful. I have never once used a syringe or any other apparatus for washing out to remove fragments.

Chloroform has been occasionally used—that is, in a very small minority of cases. There has been no instance of trouble with impacted fragments. Certainly on not more than two or three occasions have I found it necessary to use a pair of forceps to remove one.

I have particularly avoided the removal of any large fragment by the urethra. Nothing is easier, and, I may add, as a rule, more injurious. The lithotrite, at almost every sitting, contains between its blades a fragment which might be drawn through that canal. But it seems to me unwise to do this, when one turn of a screw pulverizes the fragment, and the débris comes away harmlessly enough by the natural powers of the patient. And no benefit can accrue from the removal of fragments whole, as compared with their removal in powder.

It is certainly a safe and useful plan to instruct the patient to pass no water during the first twenty-four hours after a sitting, except in a recumbent position on his back. The urine flows off, leaving the larger fragments behind in the bladder. Subsequently the urethra becomes less sore; the fragments are more water worn, and therefore less sharp; and the passage and the fragments are better fitted for contact with each other during the expelling process than at first. I am persuaded that this is a useful practice, and I have pursued it now for some time; invariably after the first two or three sittings with a large and hard stone.—*Lancet, March* 16 *and* 23, 1867, *pp.* 330, 360.

53.—ON THE AFTER-TREATMENT OF LITHOTRITY.

By Dr. George H. Porter, Examiner in Surgery, Royal College of Surgeons, Ireland.

[It is evident that as soon as a stone within the bladder has been reduced to fragments, it is most desirable that those fragments should be removed as soon as possible. This, if it can be accomplished without teasing the bladder much, must be a far preferable plan to leaving the fragments to be expelled by the unaided contractile force of the viscus. It is astonishing how small an amount of detritus is removed by the injection of a stream of water. The return current is generally very feeble, and especially if, as is often the case, the bladder is wanting in tone.]

It has always been a desideratum to supplement the force of the bladder in the removal of detritus. The late Sir Philip Crampton saw the necessity of some efficient means of doing so, and not only suggested but employed a most ingenious contrivance, which, in my student days, I saw him use in the Meath Hospital, and which is well described in the number of this journal for January, 1846, p. 22, in the following words:—"The apparatus consists of a strong glass vessel of an oval form, and six or eight inches in length, by three in diameter, and capable of holding about a pint and a half of water; to this vessel is attached a tube of about half an inch bore, furnished with a stop-cock. The air being exhausted by means of an exhausting syringe, and one of Heurteloup's wide-eyed steel evacuating catheters being introduced into the bladder, it is next attached to the exhausted vessel; the stop-cock is then turned, and a communication being thus established between the bladder and the glass, the pressure of the atmosphere is by this means brought to bear on the bladder, and supplies an expulsive power, which may be increased to any required amount."

The instrument of Mr. Clover, of London, for injection of the bladder, and withdrawal of the injected liquid by *suction*, is such an improvement upon the former means of removing débris by injection, that having found the advantages its employment affords in speedy and safe removal of the fragments of calculi, I consider its use an important auxiliary in the after-treatment of lithotrity. It must be admitted that there can be no more important element in the after-management of a case of lithotrity, or a point more conducive to the success of the operation, than early removal of the detritus, and without injury to the prostate or urethra; and improvements in the surgical appliances for lithotrity are to be much encouraged in this direction as well as in the means of primary comminution of the calculus. By crushing the stone, in the first instance, a comparatively smooth and single calculus is converted into several angular and irregular stones; the bladder, moreover, having become more or less irritated by instrumental interference, the patient is not much better off than he was before the operation. His hopes of relief, therefore, rather depend on the removal of the crushed fragments. Every practical litbotritist will bear me out in saying that the delight of a patient is most remarkable when he sees the fragments; and, on the contrary, his spirits are depressed when the débris is tardy in making its appearance. I have found the instrument devised by Mr. Clover (to whom the profession is also indebted for an apparatus for the safe administration of chloroform) most efficacious in removing any fragments sufficiently reduced in size to pass through the large catheter attached to his syringe.

[The following is Mr. Clover's own description of his instrument as given in a letter in the Lancet for May 12, 1866.]

"My instrument consists of a glass cylinder two inches long and two wide, having an eight-ounce India-rubber ball at one end, and a vulcanite mount at the other, in which is a hole which fits closely to a collar fixed just above the rings of the catheter, so as to allow the catheter to project three-quarters of an inch inside the glass vessel."

The instrument that I have been in the habit of using was procured for me from Weiss, of London, by Messrs. Fannin, of Grafton-street. It differs from, but possesses advantages over, that described by Mr. Clover, namely, the mount is of brass attached to the glass, and to it is *screwed* on the stopper, which has a tube, the calibre of a No. 12 catheter, fixed to it, and extending into the cylinder about three-quarters of an inch. This arrangement renders it unnecessary for the catheter to project into the glass portion of the instrument, and allows the apparatus to be attached to, and detached from the catheter with greater ease.

It has been proposed by my friend Mr. Fleming to improve the instrument by adding an offset to the glass part, resembling that of the ordinary breast-pump—*vide* Dublin Quarterly Journal of Medical Science for February, 1866, and by Mr. Maunders—*vide* London Hospital Reports, Vol. iii., 1866, page 216. The late Sir Philip Crampton was not unmindful of this addition

to his instrument, a glass receptacle being attached to the brass tube united to a copper cylinder, which he had constructed to bear greater exhaustion than the glass one. I confess that, although ingenious, I cannot see the advantages of such an offset to the glass portion of Mr. Clover's syringe. When the end of the catheter extends sufficiently into the cylinder it renders it most difficult, if not impossible, to force back any fragment that may have been sucked into the instrument. Indeed, in practice I have found that a good deal of debris remains in the India-rubber portion of the apparatus instead of the glass, and certainly if it ever passes beyond the projecting portion of the catheter into the glass it will be retained just as well as with the offset. To the practical surgeon I consider this instrument of Mr. Clover's a great boon, not only to remove detritus after lithotrity, for which he suggested it, but also for the removal of clots of blood from the bladder, as I myself lately found it most efficient in a case of bleeding into this organ, arising from diseased prostate. The catheter should be of the size of No. 12, with a large eye in the concavity of its curve, and provided with a stilette made of gum-elastic to fill this aperture during its introduction and withdrawal.

The fragments of the calculus removed by lithotrity in the first case were analyzed by my friend Dr. William Daniel Moore, who stated that it was composed of lithic acid. It is unusual, at an advanced period of life, to find a calculus wholly or so largely composed of lithic acid. although in some or other of its salts it is one of the most usual ingredients of all calculi. But while there is no age exempt from the occurrence of urinary concretions, into which lithic acid enters largely, they are, perhaps, more associated with the urinary diseases of earlier than of later life. With this form of calculus there are certain advantages in the performance of lithotrity; there is less apprehension of delay and tediousness in the secondary crushings, because the absence of phosphatic salts indicates an integrity of the mucous membrane of the bladder, and an acid rather than an alkaline condition of the urine, both of which circumstances very much promote the success of any operation implicating the interior of the bladder. In cases where there is reason to believe lithic acid, or its salts, to be undergoing deposition in the bladder, it is dangerous to render the urine alkaline in the hopes of interrupting the formation of a calculus, on account of the tendency which the phosphates exhibit of forming in layers round lithic acid calculi. As soon as the urine is made alkaline, although the deposition of lithic acid may be checked, a layer of triple phosphate will replace it, and the calculus will increase in size as rapidly, if not more so, than before. In the after-treatment of cases of lithic acid calculus it is of importance to prevent a re-disposition in the bladder of this ingredient of the urinary excretion, which will be very liable to occur if the diathesis be not combated. With regard to the urine, it is not necessary to render it more than neutral, for which purpose the waters of Vichy and the carbonate of lithia are well adapted. It is to be borne in mind that should it be rendered alkaline the phosphates are ever ready to take advantage of a small hemp-seed or pin-head particle of gravel, and upon it, as a nucleus, to initiate a rapidly-growing stone. The object of keeping the urine neutral is to keep the lithic acid in a soluble condition until after its removal from the body. It is also most important to keep the action of the skin healthy, as it has been ascertained that the quantity of lithic acid in the urine is augmented when the cutaneous transpiration is interfered with. Warm clothing, the wearing of flannel or chamois leather next the skin, occasional diaphoretics, and the use of the vapour bath, are means of warding off the excessive formation and deposition of lithic acid concretions which will be worthy of attention after the removal of a calculus of this description. At the same time it will be necessary to endeavour to restore the proper tone of the organs of digestion, and to combat any peculiar form of dyspepsia which may be present, since the lithic acid diathesis is so much due to defective primary assimilation.—*Dublin Quarterly Journal, Feb.* 1867, *p.* 28.

54.—ON THE IMMEDIATE TREATMENT OF STRICTURE OF THE URETHRA.

By Barnard Holt, Esq., Senior-Surgeon to the Westminster Hospital.

[The following paper is intended to embrace the experience of Mr. Holt in the immediate treatment of stricture of the urethra during the last twelve months, selecting for description a few of the most interesting cases.]

During the past year I have operated on 114 cases without a single bad result of any kind whatsoever, and with only one complication (a small abscess of the penis), which arose in consequence of the density of the stricture breaking the directing rod of the instrument. The cases embrace every variety, and occurred in my private and hospital practice, in patients sent to me from all parts of the kingdom and abroad.

With the above exception of abscess of the penis, of which I will give short particulars, every case has succeeded to my most entire satisfaction, and not more than twenty per cent. have even had a rigor, the remainder being so far well as to leave the house on the second day from the operation, when, if they had so desired, the majority could have resumed their ordinary occupation.

The first case I will record is that of an officer sent to me from India. After several attacks of gonorrhœa, which laid the foundation for stricture, he had infiltration of urine, followed by abscess of prostate. The infiltration gave rise to fistulous openings in the perineum and right buttock, and the abscess of the prostate burst into the rectum, establishing a recto-vesical fistula. Through each of these openings the urine flowed so much more freely than by the penis that he was always compelled to undress and sit on some vessel when he required to pass urine. His previous sufferings had seriously damaged his health, and when I first saw him he presented a most dejected aspect, being very much attenuated and hectic. The urine that passed per urethram only came guttatim, while that which escaped by the perineum and buttock came by a tolerable stream. Of course he had what he described as frequent diarrhœa, from the irritation caused by the urine in the rectum.

At my first examination I found it impossible to pass any instrument into the bladder; the small catheter that could be introduced through the strictures immediately entered the opening in the rectum, which was ascertained to be about half an inch in length, and the parts were so painful and irritable that it was impossible to proceed without resorting to chloroform. On a future day the patient was rendered insensible by chloroform, administered by Mr. Clover. After very considerable trouble, I passed the dilator into the bladder and split the strictures with the No. 12 tube, and, as there was so extensive a rent in the rectum, I deviated from my usual practice and retained a gum-elastic catheter in the bladder. The after-treatment was carried out in the ordinary way. The patient never had a bad symptom; the fistulous openings in the perineum and buttock rapidly closed; and at the present time he micturates with perfect ease, the rectal opening having so far closed that only one or two drops escape. A No. 11 can be passed with great facility.

The second case I shall refer to was even more complicated than the first, for no urine had been passed per urethram for nine months previous to my being consulted. The urethra at the bulb was entirely occluded, and all the urine escaped through a fistulous opening far back in the perineum. The bladder was never entirely relieved, and the urine was loaded with mucus and pus. The patient's health was so much damaged by the absorption of the fetid ammoniacal urine that it was with difficulty he could be removed to London. Previously to the administration of chloroform I made several attempts to introduce the finest catheter, without success; but eventually while under chloroform, I passed by force a No. 4 through the obstructing point, guiding it as nearly as I could along the urethra into the bladder; the dilator was then introduced, and the passage was at once enlarged with a No. 12 tube, a No. 12 gum-elastic catheter being afterwards retained. The

patient suffered but little from the operation, and the urine flowed freely through the catheter; this was removed at intervals of five days, when another was substituted. His health rapidly improved; the urine lost its ammoniacal odour, and soon became perfectly clear; he was enabled to drive out; and his appetite, which had almost entirely failed him, returned, so that he could now take food freely. At the expiration of a month the catheter was removed, but the attempt to relieve the bladder in the ordinary manner failed, and only a very small quantity of urine could be passed. The catheter was replaced, and he daily improved in health. He was now taught to remove and reintroduce the catheter, which he accomplished with the greatest ease and without the slightest pain. He has continued this plan for the last six months; but although his life has been saved. he cannot do without the catheter, and I do not think he ever will. My belief is, that the course of the urethra was not kept at the strictured part, but that a passage was forced by the side of the stricture, through which the catheter can be easily passed, but through which he has little power of micturating. It is just possible that in the course of time the new passage may become so patulous as to allow a small stream to be made.

The next two cases are recorded simply to prove the little danger that follows on the performance of the operation in difficult cases, although the patient may be far advanced in years.

A gentleman well known in London, aged seventy-two, consulted me for what he termed intractable stricture of the urethra, through which all the surgeons he had previously consulted had failed to pass any instrument; and partly from the want of success, and partly from the pain he had undergone, and the hemorrhage that ensued after every attempt at catheterism, he was very reluctant to permit any further examination. He informed me he had been the subject of stricture for more than thirty years; that his stream of urine had been gradually diminishing; that he was obliged to pass urine so frequently both during the day and the night that he was debarred from general society; and his health was materially damaged by want of rest and the absorption of the decomposed urine he had such difficulty in voiding, and which now only came by drops or continually leaked away, wetting his clothes, and rendering him a misery to himself. Upon a consultation, he was advised that as there was no probability of a catheter being passed, he had better abandon all instrumental interference, and be content to permit the urine to dribble into a urinal, which he was recommended to wear. I persuaded him to permit a further trial; and failing with a silver catheter. I bent a small gum-elastic one, and succeeded in passing it into the bladder. Regarding the experience of his former surgeons, I tied it in, and sent him at once to the Burlington Hotel. On the following day the catheter was removed, and I succeeded in passing the dilator, and split two strictures, afterwards introducing a No. 12 with great ease. This gentleman never had a single bad symptom of any kind whatsoever. He was up and in the coffee-room on the following day, and from that time there has not been the slightest difficulty in his passing the large instrument. He assures me he passes urine as well as he ever did, and that he does not suffer the least pain. His health is greatly improved, and he can now accomplish more than he has done for many years.

The next case is so similar to the one already related that it would be a waste of valuable space to record the details.

A member of our profession, seventy-four years of age, a resident in Guernsey, who was to have consulted me last year, but was prevented by an attack of apoplexy, lately consulted me with as nearly as possible the same symptoms as were complained of in the above case. He had two strictures, which had hitherto resisted the passage of a catheter, and the urine was now passed guttatim. I fortunately, in his case, succeeded with a half No. 1, which was retained until a larger size could be passed. This in three days was so far accomplished as to enable me to pass the dilator, split the strictures, and afterwards introduce a No. 12 catheter. He never had a bad

symptom of any kind whatsoever, and in ten days' time returned to Guernsey, passing his own instrument with perfect ease.

The following two cases are recorded to show the probability that epilepsy and stricture are occasionally associated, and that by relieving the stricture the fits may cease.

I was requested by my colleague, Dr. Radcliffe, to undertake a case of difficult stricture in an officer of artillery, who for some years had been subject to repeated epileptic seizures, the attacks having become more frequent prior to my seeing him. The patient was a tall, well-proportioned man, but who now presented a distressed and exhausted appearance, and who, from the complexity of his ailment, was then upon sick leave. Under Dr. Radcliffe's care, he had materially improved; but the fits still recurred, and the difficulty in micturition was daily increasing. Upon my first two examinations I did not succeed in passing any instrument into his bladder; and, previous to the third attempt, he was seized with epilepsy while coming to my house, the fall causing a severe scalp wound, for which he was at once taken to the Charing-cross Hospital. The severity of the blow detained him for a day or two, when he returned under my care. A small gum-elastic catheter having been passed and retained, the dilator was subsequently resorted to, and the strictures were split with the No. 10 tube, the largest size his urethra would admit. For some days he was confined to the house from sickness and depression, but he never had another epileptic seizure; and although there was some difficulty in the after-treatment, occasioned by an enlarged prostate, yet he has always been enabled to pass his own instrument.

The second case was very similar; but with better results, so far as the size of the stream was concerned. This patient, who had frequent epileptic seizures prior to his operation, never had one afterwards, and has now gone abroad apparently perfectly well.

In the case that I alluded to, where the directing rod of the instrument broke, the stricture was the densest I ever remember to have met with. It occurred in a gentleman residing in Devonshire, who had been long inconvenienced by all that attends a bad stricture. At my first visit, I could pass a No. 3, but after every introduction he had retention of urine, and he only recovered from the irritation caused by the bougie when it was time for him to have it passed again. The dilator was first used without chloroform, but the density of the stricture was such as to require considerable force, and, the patient giving a sudden start, the directing rod broke; this gave rise to smart bleeding which was arrested by the passage of a No. 3 catheter, introduced to prevent infiltration. On the following day I passed the dilator under chloroform, and with great difficulty thrust the tube between the blades; the stricture gave way with an audible snap, and a No. 12 at once entered the bladder. As the urethra had been lacerated by the breaking of the rod, I tied in the No. 12; inflammation, however, supervened, and a small abscess formed in the spongy portion of the penis, *three inches in front of the stricture;* this was opened, and the patient speedily recovered, when, having been taught to pass his own bougie, he returned to the country perfectly well. No infiltration of urine or other inconvenience resulted from the forcible rupture of the stricture.

It would be useless in the present communication to give any more cases in detail. As in my observations on the immediate treatment of stricture of the urethra are recorded all the varieties of stricture that are likely to be met with, I will only add that the experience of another year convinces me more than ever of the safety of the operation, and its applicability to all forms of stricture, and the permanency (where the after-treatment has been carried out) of its results. I again assert, that in all cases where the stricture *has been fairly split* the best known results are obtained, and I still entertain the strongest belief that this plan of treatment must supersede all others.

In the Lancet for June 16th, 1866, are some remarks by Mr. Henry Thompson "On the Treatment of Stricture of the Urethra by Over-Distension;" and the great point in Mr. Thompson's argument is, that by his instrument he is enabled to dilate the stricture to No. 16 or more, although

the meatus will only admit a No. 12; and so he infers that a great advantage is obtained by dilating the stricture four sizes larger than the orifice of the urethra would admit. And this undoubtedly would be so if the dilatation could be maintained; but Mr. Thompson goes on to state, after the operation has been completed "a large gum catheter is passed. and tied in for twenty-four hours." "I pass no instrument for two days, then a full-sized bougie every day or two, prolonging the intervals, and teaching the patient to do it himself occasionally afterwards."

Now, the necessity for the introduction of a bougie proves one of two things: either that the stricture has never been dilated beyond the size the meatus will admit, or else that the dilatation to No. 16 cannot be maintained. If it could be maintained, Mr. Thompson would have no occasion to pass an instrument four sizes less than the one he has just dilated the stricture with: and if it cannot be maintained, then there is no advantage in having dilated a stricture to No. 16, which has to be kept open by a No. 12. Mr. Thompson further states, "*I distend as much as possible, and rupture as little as possible.*" Now as the benefit to be derived from this treatment is so entirely opposed to not only my experience, but the experience of a large number of surgeons who adopt my operation, I cannot reconcile Mr. Thompson's results with my own.

During the past year I have had opportunities of seeing some of the patients whose cases are recorded in my book, and in only two instances has the stricture so recontracted as only to admit a bougie one size less than was attained at the operation. For example, where the patient after the operation could pass No. 12, he can now only pass No. 11, and this after the expiration of six years. In all the other cases that occurred in my private practice the patients have remained well, and the same instrument can be passed now that was passed at the time of the operation. In some of my hospital cases, however, the stricture has relapsed simply from the fact that the patients have permitted two, three, and four years to elapse without having any instrument passed. Of course, as I have previously stated in such cases, the stricture will recur, and unfortunately at the present time we do not know any method of treatment that will prevent it. There is, however, this remarkable fact, that if the stricture *has been fairly split*, although the after-treatment may have been neglected, yet it can be again immediately dilated to the full size by passing the large tube slowly between the blades of the instrument, and if ordinary care be now taken the full size can be maintained.

Does the same success attend the operation in other hands? My reply is that, with all intelligent surgeons, it does; but when surgeons will force a passage with *the dilator* in cases where they cannot introduce *a catheter*, or continue to dilate the stricture to Nos. 5 and 6 or more previous to using it, then unfavourable results must be met with. In the first there is no security that the dilator does not deviate from the urethra; and in the second the stricture is not split, but simply further dilated.

In conclusion, if surgeons will only exercise one caution, they need have no hesitation in performing the operation: pass a small gum catheter, retain it in the bladder for a few hours, and immediately on its withdrawal introduce the dilator; and, if this is kept in the urethra, there need not be the slightest hesitation in at once *rapidly* thrusting the chosen tube between the blades of the instrument. *I* am always certain the dilator is fairly in the bladder before I use the tube; but if this is not done the result must be a failure, for which I am in no manner responsible.—*Lancet, Dec.* 8, 1866, *p.* 631.

55.—OVER-DISTENTION AND RUPTURE OF THE URETHRA.

By Henry Thompson, Esq.

A very few words will suffice in reply to Mr. Holt's argument respecting my method of treating stricture by over-distention. Mr. Holt makes a theo-

retical objection to it because I pass a bougie after the operation; and draws the inference, for which there is not an iota of ground, that no benefit results from opening the stricture to the full size of the bulbous urethra—viz., about No. 16 or 18,—instead of stopping at No 12, the size to which his method is limited. I pass a bougie after the operation *for the same reason* which leads Mr. Holt to pass a bougie after his operation; that is, because we know that without the subsequent use of the bougie no treatment whatever can be relied on as permanently useful. Since recontraction always takes place to a greater or smaller extent, I hold it rational to believe that it is better that such recontraction should commence from No. 16 than from No. 12, and my experience corroborates that belief.

Mr. Holt says, "the benefit to be derived from this treatment" (of mine) "is entirely opposed to not only my experience, but the experience of a large number of surgeons who adopt my operation." If Mr. Holt has tried it, he is entitled to say this; if he has not, I think he is not capable of judging. I have tried both methods many times, and have no hesitation in preferring over-distention for the majority of cases; while I should, and do, adopt (as I have before said) "rupture" for a much smaller number. It is only fair to add that my instrument is quite capable of producing rupture, if desired, when rapidly opened, and to a greater extent than by the other method. —*Lancet, Dec.* 15, 1866, *p.* 670.

56.—ATONY OF THE BLADDER FROM STRICTURE OF THE URETHRA.

Case under the care of T. B. Curling, Esq., at the London Hospital.

[The patient who was 36 years of age, complained of being troubled with a constant dribbling of water. He had had stricture for some years, and about ten months before he had an attack of retention of urine. The bladder was relieved by catheterism and the stricture cured, but still the dribbling of urine continued. The bladder was emptied regularly with a catheter, and the patient put on good food and twenty drops of tincture of iron three times a-day. He was discharged cured.]

In the course of some clinical remarks on the above case, Mr. Curling said that its nature might easily be overlooked by those unaccustomed to treat diseases of the urinary organs. He then pointed out that the history of the case showed that the bladder had been greatly over distended in an attack of retention. After the urine has been thus retained the muscular coat of the bladder does not regain its contractile power, consequently the urine accumulates up to a certain amount, when distension of the neck of the bladder allows its escape, and the urine then goes on dribbling away, more or less in proportion to the quantity secreted. The fibres of the bladder are now unequal to the task of expelling its contents, especially through a strictured channel. They have been over-stretched, and in this way have lost their tone. Even after drawing off the urine daily and thus preventing distension, it will be found that the expulsive power usually returns but very gradually, and sometimes not at all. In this case under treatment for sixteen days, the patient had regained the power of micturition. He could hold his water for two or three hours, and exercise sufficient expulsive power to void the whole of the urine in the bladder.

Mr. Curling then pointed out that this condition is not, as some might suppose, a paralysis of the bladder, but an atony, a loss of tone and power from over distension. A similar state of things is sometimes met with in the rectum, as pointed out in the lecturer's work on diseases of that part. in which there is a chapter entitled "On Atony of the Rectum," where cases are described as loss of tonicity and defective muscular power in the lower bowel, preventing the proper extrusion of its contents.

Mr. Curling then went on to show how the atonic state of the bladder in this case, arising from over-distension, may be contrasted with a not uncommon condition, arising from some impediment to the escape of the urine.

For example: a thickening of the bladder, chiefly owing to hypertrophy of its muscular coat; in their frequent efforts to overcome the obstruction, the muscular fibres acquire an abnormal development—the exact opposite to the state of the bladder seen in cases of atony. The treatment adopted in the case reported above was complete emptying of the bladder with the catheter once a-day. This process prevents too great accumulation of urine, enables the muscular fibres of the bladder to contract, and at the same time distends the strictured part of the urethra. To give strength and tone to his system he ordered the citrate of iron and stryohnia. At a later period he substituted the muriated tincture of iron to improve the quality of the secretion.

The result was quite satisfactory, and the recovery of expulsory power more rapid and complete than usual.—*Medical Press and Circular, Jan.* 2, 1867, *p.* 10.

AFFECTIONS OF THE EYE AND EAR.

57.—ON EXTRACTION OF CATARACT.

By Prof. Von Graefe, Berlin.

[Professor Von Graefe states that from a personal experience of about 300 operations for cataract by his "Modified Linear Extraction" in 90 per cent. he has obtained a complete result, and in 82 per cent. the healing process was absolutely normal. In 10 per cent. of all the cases operated upon, the results were unsatisfactory; but among these the majority were cases of imperfect success, admitting of improvement by subsequent operation.]

After some observations on the position of the patient and operator, and on the direction of the light, v. Graefe proceeds to discuss the use of chloroform. He employs this agent in only a small number of cases (7 per cent.), and less frequently now than formerly. He thinks that a moderate and controllable action on the part of the ocular muscles promotes the escape of the lens, and that the power to make the patient "look down" facilitates the removal of cortical remains. On the other hand, chloroform is of essential service when the action of the ocular muscles is spasmodic or excessive, either on account of mechanical conditions, such as unusual tension of the lids, prominence of the globes, or blepharophimosis, or on account of extreme reflex irritability, or of want of self-control. The surgeon must therefore give or withhold chloroform in accordance with the state of the eye and its appendages, viewed in relation to the general condition of the patient.

The spring speculum in common use has been modified by v. Graefe by bending it backwards towards the temple of the patient, so that it is not in the way of the operating hand. Professor v. Welz has further improved the instrument by adding two little branches to the palprebal portions, by means of which it can be grasped and controlled with facility, and can be removed from the eye with greater delicacy than before. Stress is laid on the position of the fixation forceps, which should seize the conjunctiva close to the corneal margin, and exactly in a line with its vertical meridian. With regard to the sclero-corneal section, the directions formerly given remain in force; and with regard to the formation of a conjunctival flap to the incision, the following conclusions are stated: 1. The presence of a conjunctival flap, covering the whole length of the wound, certainly promotes rapidity of healing and firmness of cicatrix, but plays a very subordinate part in the ultimate result of the operation. 2. Slight differences in the size of the conjunctival flap are wholly unimportant, but it is better that its centre should be sloped a little downwards, and not cut to a point running upwards. The latter form is apt to become rolled, and to occasion swelling and discomfort. 3. Very large conjunctival flaps, extending more than a line and a half from the corneal margin, or reaching towards the reflection, are to be avoided. They occasion bleeding, infiltration of the submucous tissue with blood, trouble from coagula, and difficulties in the removal of the lens and cortical fragments.

With regard to the iridectomy, v. Graefe's experience leads him to insist very strongly upon its being complete up to the angles of the wound. If, from any cause, points of iris tissue are left projecting into the wound, an endeavour must be made to cause them to retract into the anterior chamber, by slight friction upon the eyeball through the closed upper lid, as in prolapsus iridis after flap extraction. In order to accomplish the complete excision that is desirable, it is well to press a little upon the globe with the closing blades of the scissors. If pointed fragments be left, v. Graefe endeavours to seize and excise them. The drawing out of the iris by the forceps before cutting it must be done carefully and without force; and Mr. Bowman's method of partial tearing from the ciliary margin is recommended with some reservation. V. Graefe appears to doubt whether this or any other method accomplishes the removal of the whole width of the iris; and he cites the case of a patient who died from delirium tremens shortly after linear extraction, and in whose eye he found that a strip of iris, half a millimetre in breadth, had escaped his manipulations. He is careful, before proceeding to the iridectomy, to turn down any conjunctival flap that may have been made, in order to avoid any possibility of curtailing it.

If, after the iridectomy, there be bleeding into the anterior chamber, it is desirable to wait a little before proceeding to open the capsule, since the presence of blood interferes with the accurate performance of this step of the operation. If the closed lids be lightly pressed upon with a pad of charpie for a minute or two, the bleeding will usually cease, and then slight pressure on the sclera above the section will cause the escape of the blood. During the opening of the capsule slight pressure should be made on the globe with the fixation forceps, so as to steady the lens, and to offer the necessary resistance to the cystitome. In order to insure complete laceration the cystitome may be carried round the equator of the lens, a little over its posterior aspect.

For the removal of the lens, v. Graefe states that it is in every case *possible* to dispense with any form of traction instrument, and to accomplish the desired end by the gliding pressure of the back of the spoon upon the sclera above the wound. The advantages of so proceeding are a less liability to loss of vitreous (in the ratio of 4 to 10), and a more complete escape of the cortex. On the other hand, when the lens is hard, its removal by pressure only takes more time, and therefore protracts the tension of the wound and of the iris, and occasions a larger percentage of cases of delayed healing. The use of the traction-hook is therefore to be recommended when the lens does not readily yield to pressure, and will be required in about one operation out of eight. To determine its necessity must be a matter of tactics and experience; but v. Graefe mentions as a chief indication an arrest of the progress of the lens—a stopping or sticking fast on its way. In such cases he still thinks his hook the best traction instrument that has been devised. When the lens is escaping regularly and uniformly under pressure, but threatens to lose the lower part of its cortex, he places the back of the spoon on the lower part of the cornea, and makes a gliding pressure upwards.

The lens being removed, the patient should turn the eye upwards, a movement that promotes the closure of the wound, and that facilitates the removal of the spring speculum.

Finally, it is necessary thoroughly to clear the pupil of cortical masses, and to press down the conjunctival flap into its proper position. After waiting a minute, renewed pressure should be used, in order to empty the chamber of its small resecretion of aqueous humour, by which some small cortical fragments will be floated away in suspension.

The uninterrupted healing of the great majority of the cases has allowed of an extremely simple after-treatment. The compressive bandage has been applied on the operating table, and the patient led away to his ward. Sometimes, on account of the pain occasioned by the fixation forceps, and by the conjunctival wound, cold moist compressors have been applied for the first ten or fifteen minutes, and then replaced by the bandage. This is at first drawn somewhat tightly, in order to procure perfect adaptation of the wound, and to check any tendency to bleeding. The bandage is allowed to remain

undisturbed for about six hours. The second bandage, somewhat less tight than the first, to allow room for transudation, but still tight enough to close the eyelids, and to keep them and the globe at rest, may remain from about the sixth to about the sixteenth hour. The third, again, is drawn more firmly, and especially firmly if there be any appearance of swelling. The period from the sixteenth to the thirtieth hour is the most critical, and firm pressure is then of especial value. During this period, v. Graefe makes a fourth ascending turn of the bandage. It is necessary, after linear extraction, to make the second and third turns of equal tightness, and not, as in flap extraction, downwards, to have the second somewhat loose and the third tighter. This method, which closes the downward flap, would tend to open the upper linear section. When there is a plentiful secretion of tears, the compress must be renewed more frequently than usual in the time immediately following the operation; but such plentiful secretion, commonly associated as it is with periodically increased tenderness to touch, is usually stopped by a night's rest, obtained when necessary, by a morphia injection.

Although the chief purpose of the bandage is fulfilled in the first thirty-six or forty-eight hours, it should be retained for four or five days and laid aside gradually, first for an hour or so in the day, then for a longer period, then for the whole day, and lastly at night. When an eye has become accustomed to a certain pressure, its sudden and complete removal may produce a congestion, followed by hurtful consequences; and it is well known that the ocular vessels are always more distended during the hours of sleep.

Although after linear extraction there is less necessity than after the flap operation to keep the patient at rest, yet still there must be no want of caution in this particular. Opening and inspection of the eye should be avoided when all is well externally, and only practised by the aid of a wax-light and focal illumination, when swelling or other bad symptoms demand careful scrutiny. Atropine should not be instilled until the third day, and then once or twice daily. If it produce irritation of the conjunctiva, a weak solution of acetate of lead may be used alternately with it.

If the section pursue an abnormal course, the treatment is much the same as after flap operation. If within six hours the pain of the wound has not subsided, a morphia injection may be given; and if there be much lacrymation, cold compresses may be applied for five or ten minutes at each change of the bandage. Continuous cold will endanger the healing process. In plethoric persons, who are accustomed to lose blood, continuing pain may require venesection, followed by the morphia injection. In other cases, when the morphia does not remove pain, and the patient is not very feeble, an active purge may be given—ten or fifteen grains of calomel, with as much rhubarb, followed by a table-spoonful of castor-oil, if there be no evacuation within eight hours. These means will only be of service when they anticipate the more marked symptoms of mischief, such as profuse secretion and actual swelling of the lids. If these symptoms once appear, the only available treatment is to apply the compressive bandage firmly, to change it as often as the amount of discharge may require, and to apply warm aromatic poultices at each time of changing. At the same time the general condition of the patient may be met by appropriate treatment, either antiphlogistic or supporting.

It is not one of the least merits of the linear extraction that the eye is much sooner out of danger by this method than by the flap operation. In the former the risk of suppuration scarcely extends beyond the thirty-sixth hour. In the latter it extends even to the sixth day. In v. Graefe's practice, suppurative panophthalmitis occurred for the first time in the hundred and fifth operation.

In the cases of partial inflammation, in which the formation of pus is limited in extent, the same treatment by bandaging and aromatic (camomile) poultices must be employed with morphia injections if the pain be severe and destructive of rest. When the acute stage is past, the effects may require atropine instillation, or sometimes leeching and mercurial friction.

When a slight and sub-acute or chronic irritation is set up, sometimes du

to the entanglement of a bit of iris in the wound, sometimes to imperfect coaptation of its edges, sometimes to cortical *débris*, sometimes to a premature removal of the bandage and relaxation of care, it is necessary to continue the ordinary treatment longer than usual, and sometimes (after the third or fourth day) to use leeches. Any projecting portion of iris should be cut off, and the aqueous humour, if turbid, evacuated by puncture. Once only has v. Graefe found it necessary to make a downward iridectomy for the cure of such irritation.

A number of rare accidents are next mentioned and discussed, and the Professor then goes on to the subject of residual capsular opacities. He counsels great care in operating upon them, a delay of at least four months, unless there be increased tension, and a very clear prospect of improvement to sight as an essential condition for interference. A few pages are then devoted to escape of the vitreous humour, and among other possible results of this occurrence, it is said that the presence of vitreous humour in the wound may be a source of delayed healing and irritation, and therefore of danger to the result.

The death from delirium tremens, already mentioned, afforded evidence of the exact apposition of the margins of the wound in linear extraction. After flap extraction, the margin of the flap always falls a little below the level of the part from which it was severed.

With regard to the best time for the performance of a cataract operation, there are several circumstances to be taken into account. Sometimes failing vision interferes with the power of the patient to earn a living; and it is necessary to operate earlier than one would choose to do under more favourable circumstances. Sometimes failing vision affects the spirits and health so much that on this account an early operation is desirable. But, *ceteris paribus*, and with some exceptions, we say that both unripe and overripe cataracts are unfavourable for flap extraction. V. Graefe thinks that unripeness is of far less importance as an objection to linear extraction; although he does not deny that the transparency of portions of the lens may place a difficulty in the way of entire removal. The practice based upon his present experience is as follows:—

1. When with monocular cataract-blindness the second eye is completely healthy, extraction should only be undertaken, in patients above the age of 50, under peculiar circumstances, or at their urgent desire; and never in the grey-headed. With young or middle-aged people it may be undertaken even before the cataractous eye is quite blind.

2. If cataract be so far advanced in the second eye that the patient can no longer read rapidly, the operation may be performed without fear upon the eye first affected, even if its cataract be not quite mature. If, in spite of commencing cataract in the second eye, the patient can still read, it is then desirable to wait for the maturity (but not over-maturity) of the first.

3. When both eyes are nearly equally affected, it is unnecessary to condemn the patient by delay to the suffering attendant on increasing helplessness. The worst eye may be operated upon when its cataract approaches maturity; and the other, eight or fourteen days later, when the result of the first operation is declared.

4. The same principle applies to the very gradual laminar cataract formations; and to posterior cortical and polar cataracts when they exist in both eyes, and interfere seriously with vision.

5. When one eye has made a good recovery from the operation, the second, in a healthy patient, may be treated boldly, and its cataract removed in an early stage. There will be much better vision with two eyes from which cataracts have been removed, than with one such while the other is still cataractous.

The paper concludes with some account of the influence of age, health, and various conditions of the eye, upon the results of the operation. Upon these points, of course, larger statistics will shortly be forthcoming.—*Ophthalmic Hospital Reports*, Vol. v., Part iv., *p.* 358.

58.—ON EXTRACTION OF CATARACT BY THE SCOOP.

By J. Soelberg Wells, Esq., Professor of Ophthalmology in King's College, and Ophthalmic Surgeon to King's College Hospital.

Prior to the operation, the pupil should be widely dilated with atropine, and the cataract examined by the oblique illumination, so that the size and hardness of the nucleus and the consistence of the cortical substance may be ascertained. For the size of the incision should be apportioned to that of the nucleus, and to the extent and consistence of the cortical substance. Nothing is more likely to mar the success of the operation than if the incision is too small, for then the iris and the lips of the section must be more or less bruised during the exit of the lens, considerable portions of the latter are sure to be stripped off, and, if they cannot be entirely removed, may set up subsequent inflammation. If the nucleus is small and the cortex softish, the incision should embrace about a quarter of the circumference of the cornea; but if the nucleus is large and hard—as, for instance, in the senile amber cataract—and the cortex firm, the size of the incision must be increased, and should extend to about one-third of the cornea. The section must also be large, if the cataract is overripe, and if little fatty or chippy fragments have collected on the surface or at the margin of the lens; for these are very apt to be stripped off and left behind if the exit of the lens is rendered difficult and forced from the section being too small.

The patient should be placed thoroughly under the influence of chloroform, so that he may be quite tranquil and passive, for any sudden start may endanger the safety of the eye, more especially during the period of the introduction of the scoop. It is, moreover, important that the different steps of the operation should be performed, if possible, without any interruption by the recovery of the patient from the effects of the chloroform: for if this happens after the excision of the iris, and there is any considerable bleeding into the anterior chamber, it may be impossible to remove the blood before it has become coagulated, owing to the time lost in again getting the patient thoroughly narcotised, and this will considerably enhance the difficulties of the other steps of the operation. The operation of scoop extraction is divided into four periods. 1. *The incision.* 2. *The iridectomy.* 3. *The laceration of the capsule.* 4. *The removal of the cataract by the scoop.*

1. *The Incision.*—With regard to the direction of the incision, I think it should always be made upwards if the surgeon is a dexterous operator and has a good assistant. As it is, however, somewhat more difficult to use the knife and the scoop in this direction than if the section is made outwards, I should advise you at first to perform the latter, more especially if the operation is upon a patient in whom neither the personal appearance nor the attainment of the most perfect vision is of much consequence. But when you have acquired some dexterity and practice the section should always be made upwards, for thus the unsightliness and discomfort of the artificial pupil will be avoided, as it will be more or less covered by the upper lid. Let us now suppose that the right eye is to be operated upon by the upper section. The operator should stand behind and slightly to the left of the patient. Having fixed the lids with the stop speculum, he seizes with a pair of forceps held in the left hand a fold of conjunctiva and sub-conjunctival tissue, exactly beneath the centre of the cornea, and just in front of the insertion of the inferior rectus muscle, and thus steadies the eye and rolls it down so as to bring the upper edge of the cornea well into view. The point of a broad and slightly bent iridectomy knife is to be entered at the very edge of the upper portion of the cornea, just at the sclero-corneal junction, and then pushed slowly and steadily across the anterior chamber, being kept quite parallel to the iris until the section is of the desired extent. It is then to be slowly withdrawn, the angles of the incision being somewhat enlarged by slightly tilting the edge of the knife; or this may be done with a pair of blunt-pointed scissors. If the cornea is very small, the incision may be made somewhat in the sclerotic, but this is often accompanied by the dis-

advantage of bleeding into the anterior chamber from the conjunctival vessels, which may render the subsequent steps of the operation more difficult. Mr. Critchett makes the incision in the cornea, half a line from its junction with the sclerotic.

2. *Iridectomy.*—If the incision is not well in view, an assistant must fix the eyeball just below the cornea, and roll it downwards, without, however, dragging or pressing upon the eye; for if this be done, the hyaloid membrane may be ruptured, and the vitreous humour escape. If the iris does not protrude through the incision, a pair of small iris forceps are to be introduced (closed) into the anterior chamber, and a fold of iris seized, drawn out through the incision, and snipped off with a pair of scissors. This may be done either at one cut, or, still better, in the following manner, as devised by Mr. Bowman:—The prolapsed portion of iris is to be drawn towards the right-hand angle of the incision, and there partially divided. The remaining portion is then to be gently torn from its ciliary insertion (slight snips with the scissors aiding in the division), and drawn towards the opposite angle, where it is to be completely divided. In this way a good-sized pupil is obtained, reaching quite up to the periphery. I think it best to remove a large segment of the iris, as it diminishes the danger of bruising the iris in the withdrawal of the cataract, and allows more scope for the use of the spoon; and if any considerable fragments of lens should remain behind, there will be more room for them to swell up in, and there will be consequently less risk of inflammation. If there is any hemorrhage into the anterior chamber, the blood should be removed at once before it coagulates. The end of the curette is to be inserted between the lips of the incision, and a slight pressure at the same time made by the forceps upon the lower part of the eyeball. The escape of the blood may also be facilitated by gently gliding the back of the curette over the cornea towards the incision. The blood should, if possible, be removed from the anterior chamber, as it masks the further steps of the operation—viz., the laceration of the capsule and the use of the scoop, both of which require that the operator should see clearly what he is doing.

3. *Laceration of the Capsule.*—For this purpose either Graefe's cystotome or the pricker may be employed. I myself prefer the latter for this operation. The operator should roll the eye gently downwards with the forceps (held in his left hand), and pass the pricker, with its blunt part downwards, into the anterior chamber, as far as the opposite edge of the pupil, and even a little beneath the margin of the latter, especially if there be slight adhesions of the edge of the pupil to the capsule, which will be thus torn through. The point being then turned towards the lens, the pricker is to be drawn gently along on each side and in the centre, so that the capsule may be freely lacerated quite up to the margin of the lens corresponding to the incision. But the instrument must be used very lightly and delicately; otherwise the lens may be dislocated, especially if the cataract is hard. If the nucleus is large, and there is consequently only a small portion of superficial soft cortical substance, or if the cataract is immature, Mr. Bowman recommends that the body of the lens should be loosened from the capsule with the pricker or a fine bent needle by being rotated on its antero-posterior axis to and fro within the capsule.

4. *The Removal of the Lens by the Scoop.*—I have already stated that Waldau's instrument is too large, and that either Mr Critchett's or Mr. Bowman's form of scoop is to be used. The former is so constructed as to glide readily behind the posterior surface of the cataract. It is thin, flat, and concave, so as to adapt itself accurately to the posterior convex surface of the lens. At the end there is a small receding edge, which assists in fixing and holding the cataract, and thus facilitates its removal. Mr. Bowman thinks, however, that this wedgelike end occupies too much space behind the nucleus. He, therefore, prefers another form, the end of which is not recurved, but looks from it at a very obtuse angle, and the extreme edge is very thin. The sides, except towards the end, have no edge above the general level. In those cases in which there is no soft matter to permit

room for the insertion of the scoop between the lens and capsule, he uses a different shape. This instrument is nearly flat from side to side, and but slightly concave from end to end. The end has a very thin, though not sharp edge, only slightly incurved, and the concave surface at the end is roughened by transverse lines. For those forms of cataract in which, together with a large firm nucleus, there is a sufficient layer of soft cortical substance to permit the easy passage of the scoop, I generally use Mr. Critchett's instrument. When this is not the case, I prefer Mr. Bowman's second form.

Great dexterity, delicacy, and care are required in the use of the scoop, which is to be lightly held between the forefinger and thumb. The eye having been fixed with the forceps, the scoop is to be introduced into the section, being turned directly towards the back of the eye, so that its anterior lip may glide past the free margin of the lens exposed by the iridectomy. It is of great consequence to remember that the scoop is to be at first directed backwards, for if it be passed forwards and downwards before its anterior lip has skirted the edge of the lens, the nucleus will be pushed before it, and even perhaps displaced behind the lower portion of the iris, the hyaloid membrane will in all probability be ruptured, and a considerable portion of the vitreous humour escape even before the body of the lens has been extracted. When the edge of the scoop has passed the margin of the lens, it is to be turned quite flat, and slowly and gently insinuated into the posterior cortical substance between the capsule and the nucleus until its further end has passed the margin of the latter. This forward movement must be very delicately performed by a slightly undulating or "wriggling" motion; for if the scoop is roughly pushed on it may carry the lens before it, and thus displace it, or the hyaloid membrane may be ruptured and the vitreous humour escape. When the lens is well grasped by the scoop, it should be slowly removed, care being taken that its anterior surface is not pressed too much forward; otherwise it will bruise the iris and cornea, a not unfrequent cause of subsequent iritis and circumscribed corneitis. If small portions of cortex have been stripped off during the passage of the lens into the anterior chamber, and lie in the latter, a slight backward movement of the scoop may be made before the cataract is removed through the incision, as this will gather up such fragments and draw them readily after the main portion, or they may be afterwards removed with a smaller scoop, slight pressure being at the same time made upon the globe opposite the incision. If the detached fragments are considerable, and cling to the edge of the pupil, or remain behind the iris, the speculum should be removed and the eyelids rubbed in a circular direction, so as to bring them into the anterior chamber, whence they may be readily extracted by the curette. This is much to be preferred to the frequent introduction of the scoop. The suction syringe may also be employed for the removal of small soft fragments. Any little portions of lens matter that may cling to the lips of the incision are to be removed with the curette, as they interfere with the union of the section, and are apt to give rise to suppurative infiltration of the edge of the incision. Should a little of the vitreous humour exude through the section with the last portion of lens, it must be snipped off and a compress applied. If the vitreous escapes directly after the division of the capsule, the scoop must be passed well behind the cataract so as to extract it, if possible, *en masse*. If the loss of vitreous does not occur until the body of the lens has been extracted, any fragments of lens that remain behind should be removed. If they can be easily reached, the curette should be employed; otherwise it is better gently to rub the lids and bring them into the anterior chamber, whence they may be readily extracted. More or less vitreous will, of course, be lost, but this is better than leaving considerable fragments behind, as they swell up and give rise to great irritation and inflammation of the iris or ciliary body. The frequent introduction of the scoop is apt to produce the same mischief, and may even be followed by inflammatory infiltration of the vitreous, which may assume a suppurative character. In the latter case we can observe, with the oblique illumination, a yellow discoloration of the anterior portion of

the vitreous humour. Gradually such infiltrations may become absorbed, leaving behind them more or less dense opacities, which may be floating or fixed. Should the vitreous escape, even before the capsule is opened, Mr. Bowman advises that after the iridectomy Waldau's scoop should be introduced and the lens removed in its capsule.

The after-treatment is much more simple than that of the flap extraction. On account of the size and shape of the incision there is little danger of even partial suppuration of the cornea, or of displacement of the section; the iridectomy, moreover, prevents the occurrence of prolapse of the iris, except to a very limited extent at the angles of the incision. A light compress is to be applied after the operation, or cold-water dressing if it prove agreeable to the patient, and we have a good nurse to superintend the changing of the dressing. A strong solution of atropine (four grains to the ounce) is to be applied at the end of thirty-six or forty-eight hours, and repeated two or three times daily, or more frequently if any iritis supervene. If the atropine proves irritating to the eye, it should be changed for belladonna drops (ext. bellad. 3ss.—3j. to ℥ij of water.) The latter are to be applied in larger quantity and more frequently than the atropine drops. If the patient has had no pain in and about the eye, and if he is restless and uncomfortable in bed, he may be permitted to leave it the day after the operation, more especially in private practice or in special eye wards. In the general wards of the hospital I mostly keep the patients in bed for four or five days, as they cannot be so carefully guarded against draughts or cold, an exposure to which may set up iritis or irido-cyclitis. If the case does not go on so favourably, but there is severe pain in and around the eye, together with swelling and redness of the eyelids, photophobia, and lachrymation, leeches (two to four) should be applied to the temple (about an inch from the angle of the eye), and free after-bleeding encouraged by hot poppy fomentations. If there is much œdema of the lids, they should be painted with tincture of iodine, great care being taken that it does not run into the eye. If suppurative iritis or irido-choroiditis supervenes, and the patient is in good health, rapid mercurialisation should be produced. If the iritis should be accompanied by increased tension, and the iris is bulged forwards, paracentesis cornæ should be practised, and repeated if necessary. If the patient suffers much from neuralgic pains, quinine and tonics should be administered, and great relief is often experienced from subcutaneous injection of morphia. If suppuration of the cornea threatens, a firm compress is to be applied.—*Medical Times and Gazette, Feb. 9, 1867, p. 135.*

59.—ON THE DIFFERENT OPERATIONS FOR SENILE CATARACT.

By J. Soelberg Wells, Esq., Professor of Ophthalmology in King's College, and Ophthalmic Surgeon to King's College Hospital.

There cannot be any doubt that the common flap extraction is the most perfect operation of all, when it turns out perfectly successful. It is nearly free from pain; it does not in the least interfere with the appearance of the eye; the pupil remains central and movable; the sight is perfect, and is not at all deteriorated and confused by circles of diffusion upon the retina, which are always more or less present when an iridectomy has been performed. It must, however, be confessed that these great advantages are often more than counter-balanced by the considerable dangers which beset the operation. On account of the great size of the flap, there is much risk of the vitality of the cornea becoming impaired, and of its undergoing partial or even diffuse suppuration, which may be accompanied by suppurative iritis or irido-choroiditis Again, prolapse of the iris is a not unfrequent complication, proving a source not only of great annoyance and irritation, but even of danger to the eye. The after-treatment also demands much care and attention—more, indeed, than can generally be bestowed in an hospital, more especially in a general one, with no special nurses or ophthalmic wards. Now, in the scoop extrac-

tion, these two principal dangers—suppuration of the cornea and prolapse of the iris—are nearly completely eliminated.* On account of the position and shape of the incision, suppuration of the cornea, even of limited extent, is rare, and a prolapse of the iris can only be slight, and is confined to the angles of the section. Moreover, chloroform may be administered without any fear. But it must be admitted that iritis, chronic and insidious irido-choroiditis, inflammation of the intra-capsular cells, and secondary cataract, are more common than in flap extraction. I have found the scoop extraction so successful that I have preferred it in general to the flap operation, more especially in hospital practice, as the patient requires far less careful watching and attendance, and the after-treatment is much more simple. The confinement to the bed and house is also shorter. I think it is especially indicated in very feeble, decrepid, nervous, and unmanageable patients, who are impatient of control and confinement; in patients suffering from obstinate and severe cough, or bronchitis; also, if the pupil is adherent, or small and rigid, so that it dilates but imperfectly under the influence of atropine, or if the cataract is complicated with some choroidal or retinal lesion. But it is, without doubt, a more difficult operation than the common flap extraction, and for its successful performance demands a cool, dexterous, and practised operator. I am sometimes asked by medical practitioners and students which operation I consider the easiest and safest for an experienced operator. I think that, all things considered, the downward flap operation is the easiest, for when the section has been successfully completed, the chief danger and difficulty are passed. Whereas in the scoop extraction it is far different, more especially when the upward operation is performed. The incision has to be followed by the iridectomy, and when this has been safely accomplished and the capsule divided, the most difficult step of all—the removal of the lens by the scoop—still remains. When the surgeon has operated several times by the lower flap extraction, and has acquired some experience and dexterity, he should proceed to the upward flap operation, the scoop extraction, and von Graefe's new operation, so that he may be able to draw comparisons between them from his own experience, and adopt the most successful. I think that von Graefe's operation, if its success proves as eminent in other hands as in his own, will, in all probability, supersede the scoop and flap operations. For it not only offers all the advantages of the former—viz., the administration of chloroform, the linear shape of the incision, involving but a small portion of the cornea, and the iridectomy—but yet one more very important one, that in the great majority of cases the lens may be removed without the aid of any traction instrument. For cases of diabetic cataract, it is, I think, by far the safest operation, for in the flap extraction (even with a preliminary iridectomy) there is always some risk of suppuration of the cornea in these patients, as they are generally in a very feeble state of health. In the scoop extraction there is, moreover, the danger that the introduction of this instrument should set up iritis, for we must remember that in persons suffering from diabetes the iris is exceptionally impatient of irritation and bruising. In order to secure the greatest immunity from this danger, it may even be advisable to make a double iridectomy—viz., upwards and downwards, so as to get a broad vertical pupil, the two opposite portions of the iris being thus completely cut off from each other. The only two points in von Graefe's operation which demand practice, care, and dexterity are the incision and the removal of the lens. If the section is too small, the delivery of the lens will be difficult and forced, necessitating either considerable pressure upon the eyeball, or the introduction of some form of traction instrument. If, on the other hand, it is too large, and the puncture and counter-puncture lie too far in the sclerotic, there is imminent risk of losing much vitreous humour, even perhaps before the removal of the lens is attempted. Much delicacy and dexterity is also required in coaxing out the lens by pressing upon the sclerotic with the curette (sliding manœuvre.) For if this is roughly and clumsily done, the hyaloid will be ruptured, the vitreous

* The scoop operation will be found described by Mr. Critchett, in *Retrospect*, July to Dec., 1865, p. 2 *a*.

will escape, the lens will in all probability be pushed somewhat aside, and a scoop must be passed in to remove it. I have, in my last lecture, mentioned that this pressure upon the sclerotic is to be assisted by a light pressure by the forceps upon the sclerotic just below the cornea, which will greatly facilitate the presentation of the lens in the section. If there is no imperative call for the most perfect acuteness of vision, the section may be made downwards, for this renders the subsequent steps of the operation more easy.

Reclination or Couching.—I only mention this operation to state that, in my opinion, it should be completely abandoned. Although it may appear to be temporarily successful, it has been found that ultimately, about 50 per cent. of the eyes have been lost from chronic irido-choroiditis, &c. It is performed in the following manner:—The pupil having been widely dilated by atropine, a curved couching needle, with its convex surface turned upwards, is passed through the sclerotic at the temporal side, a little distance from the cornea. and somewhat below its horizontal diameter. When the needle has penetrated the sclerotic, it is to be turned so as to bring its convex surface parallel to the iris, behind which it is to be carried to the edge of the pupil, and then passed diagonally across to the opposite side of the anterior chamber. When its point has arrived near the inner and upper edge of the pupil, the handle of the instrument is to be lightly tilted upwards between the fingers, and the lens slowly depressed by the concave surface of the needle into the lower and outer portion of the vitreous humour. It should be kept by the needle in this position for a few moments, in order to prevent its reascending. The needle is then to be slightly rotated, in order to disentangle its point, and drawn back to the point of entrance. The operator should wait for a few moments to see if the lens rises up again, in which case the depression is to be repeated.

Division or Solution of Cataract.—This operation is more especially indicated in the cortical cataract of children and of young persons up to the age of 20 or even 25; also in those forms of lamellar cataract, in which the opacity is too extensive to allow of much benefit being derived from an artificial pupil. After the age of 35 or 40, the lens is generally too hard to undergo anything but very slow absorption, even after frequent repetitions of the operation; the iris is also more impatient of irritation and pressure, so that the danger of setting up iritis is much increased; and there are other operations which are much to be preferred for cataracts occurring at this time of life. In infants and young children an operation for cataract should not be unnecessarily postponed, as the presence of the cataract is very apt in infancy to give rise to nystagmus and to that form of amblyopia which is dependent upon non-use of the eyes, and which is similar in character to that so often met in strabismus.

The object of the operation of division is to lacerate the anterior capsule with a fine needle, so as slightly to break up the surface of the lens and to permit the aqueous humour to come in contact with the lens substance, which imbibing the fluid, softens, and becomes gradually absorbed. The time required for the absorption varies with the age of the patient and the consistence of the cataract. In infants and young children the lens is often absorbed in from six to ten weeks, and one operation may suffice for this purpose. But in adults it may have to be repeated several times, and in them great care should be taken not to divide the capsule and the lens too freely at one sitting, for this will cause great swelling of the lens substance, or the exit of considerable flakes into the anterior chamber, and either of these causes may set up severe iritis or irido-cyclitis. The same caution is necessary in cases of lamellar cataract, because in these a large portion of the lens is transparent and of normal consistence, and will therefore imbibe much aqueous humour and swell up very considerably.

Prior to the operation the pupil should be widely dilated with atropine. The patient, more especially if a child, should be placed under the influence of chloroform. Infants should be firmly rolled in a blanket or sheet so that their movements may be controlled. The eyelids are to be kept apart with the spring speculum, and the eye fixed with a pair of forceps. A very fine

needle is then to be passed somewhat obliquely through the outer and lower quadrant of the cornea, at a point lying well within the dilated pupil, so that the iris may not be touched by the stem of the needle during the breaking up of the lens. The track of the corneal wound must not be too slanting, otherwise its channel will be too long, and the tissue of the cornea will be stretched and bruised during the working of the needle, and this may produce an opacity of the cornea; nor must it be too straight, otherwise the aqueous humour might easily escape. The size and number of the incisions in the capsule must vary with the amount of effect that we desire. If the latter is to be but very slight, a single small horizontal or vertical tear may suffice, or a crucial incision of limited extent may be made. But if we desire a more considerable effect, more especially in the cortical cataract of children, the incisions must be more extensive, or the superficial portion of the lens is to be gently broken up or comminuted by a series of short superficial incisions, which converge towards the centre of the cataract. In infants and young children the needle may be far more freely used than in adults, or in cases of lamellar or partial cataract. In such, it is always safer to repeat the operation, even several times, than to do too much at one sitting. It may be repeated at intervals of five or six weeks, if it is found that the absorption has become arrested or progresses but very slowly; but all irritability and redness of the eye should have disappeared before the needle is again introduced. If the opening in the capsule is too large, or the cataract broken up too freely, the lens will imbibe much aqueous humour, and, swelling up very considerably, will press upon the iris and ciliary body, and may thus set up severe iritis or irido-cyclitis; or if the incisions in the capsule are too extensive, fragments of lens-substance may fall into the anterior chamber, and there set up great irritation.

The needle used for this operation should be very small; its cutting, spear-shaped point should only extend to about $\frac{1}{75}$th or $\frac{1}{70}$th of an inch from the end, and the stem should be cylindrical, so that the aqueous humour may be retained throughout the operation. I always use Bowman's fine stop-needle which fulfils all these indications.

The after-treatment is generally very simple. The pupil should be kept widely dilated with atropine, so that the iris cannot be pressed upon by the swollen lens, or any flakes that may have fallen into the anterior chamber. A bandage should be worn for the first twenty-four hours, and the patient should be kept in a somewhat darkened room for the first day or two, especially if there is much reaction. Generally, however, this is but slight, the eye only looking flushed, and watering somewhat on exposure to bright light. My friend, Mr. Lawson, has even successfully operated by this method upon some cases of monocular cortical cataract in adults (between the ages of 20 and 30), and treated them throughout as out-patients. These were, however, exceptional cases, in which it was absolutely necessary that the patients should follow their employment. In order to expedite the cure, which is often of consequence in patients from the country, it is a very good plan, after the lens matter has become softened by the admission of the aqueous, to remove the whole cataract by a broad linear incision. In children this may generally be done within a week after the division, and thus the sight may be restored in a few days, whereas, otherwise, many weeks or even months would have elapsed before the cataract would have been entirely absorbed. The same proceeding may be employed in cases of partial cataract, the transparent portion of the lens being made opaque, and softened by the introduction of the needle. This mode of operation has been very successfully practised and much advocated by Mr. Bowman, who also often advantageously employs the suction syringe for the removal of the softened lens after it has been previously broken up by the needle.

If symptoms of irritation and inflammation should set in after the operation of division, and they do not readily yield to antiphlogistics, but increase in severity, and more especially if the tension of the eyeball is augmented, the cataract should be at once removed through a good-sized linear incision, made near the periphery of the cornea with an iridectomy knife. This is

also to be done if the capsule has been too freely divided, and the nucleus or considerable portions of lens substance have fallen into the anterior chamber, and are setting up much irritation. If the lens is so firm that it cannot all be readily removed through the linear section, it will be wiser to combine an iridectomy with it, than to endeavour to remove the portions of lens by repeated introductions of the curette into the anterior chamber. An iridectomy is also indicated if the increase of tension has existed for some little time, and if the perception of light and the extent of the field of vision are markedly deteriorated.

Two special forms of inflammation may follow the operation and endanger the safety of the eye. In the one, the inflammation is chiefly plastic or purulent in character. The iritis, or irido-cyclitis is accompanied by plastic exudations behind the iris and into the vitreous humour, leading eventually in all probability to chronic irido-choroiditis and atrophy of the globe. In the other form, the the inflammation is of a serous nature, giving rise to an increased secretion of the vitreous humour and an augmentation of the intra-ocular pressure—in a word, to a glaucomatous condition of the eyeball, which will cause irretrievable destruction of the sight if timely relief be not afforded.

As these inflammatory complications are most apt to occur in adults above the age of 15 or 20, more especially if the cataract is only partial or of a lamellar nature, von Graefe advises that in such cases, or if in any posterior synechiæ exist, an upward iridectomy should be made a few weeks before the operation of division. By so doing, plenty of room will be afforded for the swelling up of the lens, and if fragments have fallen into the anterior chamber they will produce far less irritation.—*Medical Times and Gazette, March* 23, 1867, *p.* 301.

60.—WHEN ONE EYE IS BLIND IS IT PRUDENT TO ATTEMPT TO RESTORE SIGHT WHILE THE OTHER REMAINS PERFECT?

By H[illegible]s Walton, Esq., Surgeon to the Central London Ophthalmic Hospital, and to St. Mary's Hospital.

[This question is one which occurs frequently to men practising much amongst eye cases, and to which no definite answer is given in treatises on ophthalmic surgery.]

In discussing the subject, there are facts to be recognised, conditions and circumstances to be considered. There must be reviewed the physical causes that render the eye useless, the operations that are needed, and the probability of the result, and the quality of the sight that may be restored.

I should be deterred from operating only by the probability of the eye being too much damaged to give that amount of sight which is known as useful sight, on which point much discrimination and a long familiarity with ophthalmic surgery are imperative. I have made lateral pupils, the crystalline lens being present, and central pupils, the lens being absent. I have selected those cases only in which I was as sure as I could be that the fundus of the eye was sound, and the retina unimpaired, and the other conditions such as would insure the best amount of sight to be derived from such an operation. I place stress on this; for without it—without useful sight can be fairly expected—I would not operate. The false pupil I have invariably made either upwards or downwards, never inwards or outwards, on account of the double vision which would probably ensue. In every case decided benefit has followed. Side-blindness has been removed, and direct vision assisted; in those cases in which the lens was present there has been restoration of the ocular adjustment. I am giving general results, and avoiding minute detail. My last patient was operated on at the Central London Ophthalmic Hospital in September of this year. He was a soldier in a hussar regiment, and was acting as groom to a captain. When he was sent to me I found that there was a dense central corneal opacity with prolapse of the pupil, almost the

whole pupillary margin being adherent. I made an upward pupil by drawing out a bit of the iris and cutting it off. Mr. Wilkinson and Mr. Taylor, my colleagues, assisted me. Perfect success ensued. My patient was highly delighted at the addition to his vision and in the improvement in the focussing power of the eye. He was particularly proud of his distant sight, but he could, too, read quickly No. 9 of Jaeger's best type. There was not the slightest confusion in vision. His master, who examined him with care, wrote to thank me for the result, and enclosed a donation for the hospital.

In every case in which I have made a central pupil after the loss of the lens, the patients have expressed their satisfaction and pleasure at the benefit they have received. I am certain, therefore, from the result of practice, of the advisability in certain cases of making a false pupil when one eye is sound. It would seem that confusion of vision does not, and is not likely to, ensue when there is perfect vision in the one eye. This agrees with the fact that in "colomba iridis" in one eye no confusion follows.

I have a far more extended experience in operating when cataract affects only one eye. In the cases selected for my trial and observation, I was quite sure that the other eye was sound and not invaded by cataract.

In nearly all, my patients were under adult age; a few were young adults, and two were past sixty years of age. I will allude to five of them specially, because they were in private, were persons of intelligence, and all were seen several times after they had left me as patients. One was a well-educated, clever publican, about 32 years of age. Cataract formed without any apparent cause. I operated by solution. No better result could have been obtained. The last time I saw him he assured me that he was as pleased with the new eye as ever. He said, "The more I think of it the more satisfied I am. I no longer run against people and things."

Another was a master builder, 26 years old. His cataract was idiopathic. He sought treatment because the blindness on the one side was "the plague of his life." The result of the operation enabled him, as he expressed it, "to get on better with his business."

The third patient, about 40 years of age, was a clerk in a house of business. His disease was idiopathic. He was fully satisfied. He found the benefit he had been told he might expect.

The fourth was a governess. She came to me several times to show herself after my professional attendance had ended. She was well pleased at what had been done.

The last was a guard on a railway. He was 30 years of age. The eyeball was wounded by a splinter of wood, and cataract ensued. Since my operation he has been able to attend to his work satisfactorily. Before I operated he frequently blundered, and his defect was apparent to others.

As, then, the evidence which I have collected establishes the propriety of endeavouring to restore an amount of sight less than the standard of health in the one eye, while the other is healthy, I advocate such practice when my opinion is sought. When a child with a wounded eye and an opaque lens is brought to me by his distracted parents, anxiously asking what can be done, I set before them the state of the case, and recommend the removal of the cataract.

After 50 years of age, when, as a rule, the operation for solution is no longer applicable, because the lens is harder and the operation for extraction is the more proper, circumstances are somewhat altered, and the opinion I give a patient is modified, and for this reason. The operation for solution being so very safe, I can with confidence promise success to my patient, if time be allowed me. Extraction is attended with risk of failure. Although I suspect, from all I can learn, that I get as good results from this operation as my neighbours, I know that I cannot get the success that I can command in solution. Then there is one more degree in the quality of restored sight in the extraction cases. The sight may be very good or very inferior, although the term success is applied to all. Added to this, when a person is old, he has pretty nearly done with the active affairs of life, and he can then get on tolerably with one eye. I endeavour to do my duty in explaining all this to

a patient—adding, "If nothing untoward happen, you will be the better for the operation; if it do, you will be none the worse as regards the other eye" —and leave him to determine between the unpleasantness of the operating process and chance of failure, and the probability of success and the addition of a certain amount of sight.—*Medical Times and Gazette, Feb.* 2, 1867, *p.* 109.

61.—BROWN CITRINE OINTMENT IN THE TREATMENT OF TARSAL OPHTHALMIA AND PHLYCTENULAR CONJUNCTIVITIS.

Dr. E. Williams (Cincinnati), in the Transactions of the American Medical Association, speaks in the highest terms of a *brown citrine ointment* in the treatment of these troublesome affections. He thinks it more efficacious and less irritating than Pagenstecher's ointment of precipitated yellow oxide of mercury. All crusts being first softened and removed from the eyelashes, and the eyelashes cut close if necessary, the ointment should be gently applied to the tarsal margins with the pulp of the finger, in most cases every night. If it occasion swelling, it should only be applied every other night. In cases of phlyctenulæ it may be applied, as other ointments, with the point of a camel's hair brush. Its use should be continued, once or twice a week, for some little time after recovery, in order to prevent relapse; and it may also be applied, with great benefit, to the eruptions of the face and head with which the ocular affections in question are often associated. When there is much general conjunctivitis, Dr. Williams uses also a lotion, containing four grains of sulphate of morphia, and half a grain of sulphate of copper or of zinc, to the ounce of distilled water, to be used three times a day. If there be much photophobia, he precedes the application of the ointment by the instillation of a solution of atropine, using one grain to the ounce of water for children from one to five years old, and two grains to the ounce for children above five years. These solutions are applied from three to six times in the twenty-four hours; and quinine is also given in full doses, as one or two grains three times a day. If this method does not speedily diminish the photophobia, he combines opium with the quinine, giving from half a grain to a grain for a dose. As soon as the acute symptoms are at all diminished, the ointment is applied. In less severe cases the ointment is used from the first, with the aids of good diet, regular exercise, and tonics. All forms of counter-irritation are rigidly abstained from. The ointment is the citrine ointment of the United States' Pharmacopœia, but made with cod-liver oil instead of lard and neat's foot oil. The first product is granular, but being kept over the fire, and thoroughly melted, and then stirred until cold, a perfectly smooth, soft homogeneous ointment, of a rich mahogany brown is obtained.*—*Ophthalmic Hospital Reports*, Vol. v., Part iv., *p.* 380.

62.—A MODIFICATION OF THE STRABISMUS OPERATION.

By Dr. R. Liebreich.

By the present methods of operating for squint, it is possible to obtain a correction of 2‴ or 2½‴ in adults, of 2½‴ or 3‴ in children. If the deviation be more than this, two, three, or more operations will be required. The division of the necessary correction between two operations, one for each eye, is productive of certain advantages with regard to symmetry and equality of movement; but the repetition of tenotomy on a muscle that has been previously divided is attended by many evils. It is impossible to foresee whether the effect produced by a second operation will be small or great.

* The United States' formula is, "Hydrargyri ʒi, Acidi Nitrici f. ʒxi, Adipis ʒiy, Ol. Ped. Bov. ʒix." Dr. Williams does not refer to the great value of the compressive bandage in phlyctenular cases. Whatever treatment is adopted, the bandage should not be omitted.

The cicatrix of the former section may be imperfectly divided, and may entirely nullify the effect of the subsequent one; or, on the other hand, the complete division of such a cicatrix may require a very extensive operation, which may be followed by divergence and loss of movement, sinking of the caruncle, and all the bad results of the old and now abandoned methods of operation. Urged by these considerations, and desirous to improve the accepted methods of tenotomy, Dr. Liebreich, eighteen months ago, entered upon a careful study of the anatomy of the parts concerned.

The ocular capsule, which surrounds the whole eyeball with the exception of the cornea, is composed of two widely different portions. The posterior portion forms a cup, with a firm smooth internal surface, in which the eyeball moves freely, like the head of a bone in its socket. This cup is perforated by the four recti muscles, and forms, at the line of perforation, a sharply-defined ring, so closely adherent to the muscles, that no movement can take place between them. The union between the muscles and the posterior part of the capsule is further strengthened by vaginal processes, which spring from the outside of the capsule, and cover the muscles for some distance in the orbit. Towards the eyeball there are no sheathing processes; but the posterior part of the capsule terminates abruptly at the circle of the muscular perforations; and the muscles, anterior to this circle, are for a short distance completely free from sheaths. Before their tendons reach the sclera, they pass between that membrane and the anterior part of the capsule, and become united to the latter. This anterior portion of the capsule bears to the posterior portion somewhat the relation of a convex cover to a bowl. It is much thinner than the posterior portion, and is very difficult of dissection, since, like the conjunctiva, it rapidly loses its firmness after death.

Following the anterior portion from the anterior pole of the eyeball, we begin with a circular opening the size of the cornea, through which the latter projects. The anterior margin of this opening is united to the sclera; and, in a zone limited by this margin in front, and by the insertions of the recti muscles behind, the sclera, capsule, and conjunctiva are almost immovably adherent. Beyond the boundary of this zone the conditions change. The union between capsule and sclera is broken by the intervention of the muscles; and some loose irregular connecting tissue that here exists between the several structures has possibly furnished the basis of such complicated and fantastic descriptions as those of Guérin. The sheaths said to invest the muscles from their perforation of the capsule to their insertion, and that have been used to explain many matters, have no existence. On the contrary, as already described, the anterior half of the capsule rests on the anterior surfaces of the muscles, and is closely united to them; while the conjunctiva is closely united to the capsule over an irregular zone, the boundary of which, in eccentric movements of the eye, is indicated by a wrinkle. Beyond this boundary the union between the capsule and the conjunctiva is much looser. Part of the tissue composing the anterior portion of the capsule is reflected into the eyelids; and the rest is applied to the margin of the posterior portion, which itself sends prolongations to the margin of the orbit.

The foregoing description contains three points of special importance in the squint operation.

1. The union between the muscles and the ocular capsule is double. There is first the circular union between the posterior part of the capsule and the muscles, strengthened by the sheathing processes. There is secondly the union between the anterior part of the capsule and the muscles beneath it.

2. The conjunctiva is firmly adherent to the anterior portion of the capsule, from the margin of the cornea to the outer edge of an irregular zone. It is therefore indirectly in very intimate connection with the muscles.

3. The caruncle and plica semilunaris rest upon a band that passes from the capsule to the margin of the orbit. The contraction of the rectus internus, in adduction of the eye, stretches this band, and draws with it the caruncle towards the inner wall of the orbit. At the same time the outer edge of the caruncle, and the portion of conjunctiva next to it, are pulled backwards into a wrinkle. This is partly because the conjunctiva moves with the eyeball

up to the boundary of the line of adhesion; partly because the muscle, on account of its union with the anterior portion of the capsule, draws this backwards in contraction.

It follows from the first of these three conditions that a displacement backwards of the insertion of a rectus muscle, can only be obtained by a displacement backwards of the part of the anterior capsule that covers the muscle. This capsule, if not divided, would retain the severed tendon in its original position. On account, however, of its close adhesion to the muscle it would be very difficult, even if possible, to leave it uninjured; and, even in subconjunctival tenotomy, the capsule must usually be divided to the same extent as the tendon itself. This division of the capsule with the tendon explains how it is that a displacement backwards of the part of the anterior capsule that covers the tendon, as well as of the ring of posterior capsule that is adherent to the muscle, and therefore a displacement of the point of insertion itself, is actually effected. By enlarging the section of the capsule (v. Graefe's separation of lateral processes) the displacement backwards may be somewhat increased, but the second of the three points above mentioned is an obstacle to any considerable increase. The union between conjunctiva and capsule forbids any great yielding of the latter, unless the former also be freely divided. If this be done, we see the effect of the third point. On account of the union between muscle, capsule, and caruncle, the displaced muscle draws the caruncle, plica semilunaris, and divided conjunctiva, so much backwards and inwards that these parts assume, when the patient looks straight forward, the position that is natural to them during extreme adduction. The distance between the plica and the inner margin of the cornea is increased, the portion of the sclerotic visible at the inner side of the eyeball is enlarged, and the eye assumes the deformity of aspect characteristic of the old methods of operation. To obviate these evils, and to obtain any desired amount of result from a single operation, Dr. Liebreich proceeds as follows:—

For tenotomy of the internal rectus he lifts with forceps a fold of conjunctiva over the lower end of the insertion of the muscle, and divides this fold with scissors. He then carries the scissors through the wound, between the conjunctiva and the capsule, and carefully separates these structures as far as the plica semilunaris. The plica and caruncle are also to be separated in the same manner from the parts beneath them. After thus rendering the portion of capsule to be divided entirely free from the superficial structures, the tendon is taken up and cut through in the ordinary manner, and the perpendicular division of the capsule is enlarged, upwards and downwards, to an extent corresponding with the amount of displacement that is desired. Finally, the conjunctival wound is brought together by suture.

For the external rectus a similar operation is performed, in which the conjunctiva must be separated from the parts beneath as far as to the point that is drawn directly backwards in extreme adduction.

For these proceedings Dr. Liebreich claims the following advantages over former methods:—

1. *A greater freedom and a far greater range of effect.*
3. *Avoidance of a depressed caruncle or an unsightly cicatrix.*
3. *Avoidance, in every case, of more than two operations, that is, of more than one on each eye.*

With regard to the first of these, it is possible to obtain either the effect of an ordinary tenotomy or a correction of 4‴ or more in adults, and of 5‴ or more in children. Dr. Liebreich disclaims, however, the practice of tenotomy on one eye only in very extreme squint, and follows v. Graefe in preferring to divide the effect between both eyes. It is only in exceptional cases in which the mobility inwards of the squinting eye is much increased, and the opening of the lids not wider than in the other eye, that he rectifies a very large deviation by a single tenotomy. Under other circumstances, as when the departure of the patient, or some other reason, prevents a second operation, he prefers an unilateral modified tenotomy to the practice followed, in such cases, at Moorfields and elsewhere, of dividing both internal recti at

the same time. He more frequently is satisfied with a single tenotomy when the deviation does not exceed 3‴ in adults, or 4‴ in children. He attaches especial importance to the conjunctival suture, for which he uses a fine curved needle and the finest English black silk. Even if several stitches are inserted, no trace of a scar will remain.

Dr. Liebreich considers the third point of advantage, the rendering repeated operations unnecessary, to be the most important. He states that in this modified tenotomy, especially when the section of capsule is extensive, the difference between the immediate and the ultimate result is very great; and that, where the mobility inwards of the eye is at first almost destroyed, it will, nevertheless, be completely restored in the course of time.—*Ophthalmic Hospital Reports*, Vol. v. part iv., *p.* 390.

63.—ON SUB-CONJUNCTIVAL INJECTION OF A SOLUTION OF CHLORIDE OF SODIUM. TO PROMOTE THE ABSORPTION OF CORNEAL OPACITIES.

Professor ROTHMUND ("Monats Bl. f. Augenheilk." March—May, 1866), has been employing a sub-conjunctival injection of a solution of chloride of sodium (a scruple to an ounce of water) to promote the absorption of the diffuse corneal opacities left behind by parenchymatous inflammation. In six cases he believes that he has obtained more speedy results than any other known means would have yielded. The solution is warmed, and is very slowly injected by a syringe with a curved nozzle, through a puncture about a line and a half or two lines from the margin of the cornea. The immediate effect is to surround the cornea with an elevated ring like that of chemosis. Under a compressive bandage, the swelling disappears in five or six hours, and the resulting irritation in five or six days, after which time the cornea begins to clear from the margin. After three or four weeks the injection may be repeated; and after from three to five injections, the formation of an artificial pupil has been practicable.—*Ophthalmic Hospital Reports*, Vol. v., Part iv., *p.* 366.

64.—A CASE OF EPITHELIAL CANCER OF THE ORBIT.

By J. W. HULKE, Esq., London.

The deceptive resemblance of the external swelling to that of a carbuncle, the rapid growth of the cancer, its close sequence on a violent blow, and the safety with which the chloride of zinc paste was used for the purpose of destroying any portions of the morbid tissue which might have escaped removal by cutting, make the following case of orbital tumour one of the most instructive and interesting which I have seen:—

A railway porter, aged 42, struck his left cheek against the buffer of a carriage, and three days afterwards it became black as if bruised. Three weeks after this the cheek swelled, and the eye began to water, and in two or three days more the swelling spread to the eyelids. About this time there was bleeding from the left nostril, which has occurred occasionally ever since.

February 14th. Six weeks after the date of the injury he became an outpatient at the Royal London Ophthalmic Hospital, under my colleague, Mr. Wordsworth. At that time the lower eyelid and the skin at the inner canthus were distended, red and shining, and the eyeball was slightly displaced forwards, and to the temporal side of the orbit. Mr. Wadsworth, thinking there was an abscess, made an incision, but no pus escaped from it; and a week later he again deeply punctured the swelling with a narrow knife, with a similar negative result.

A few days after this I first saw the patient. Now the lower eyelid, especially at its centre and inner end, was very much swollen; the hollow

between the eye and the nose was filled up by a prominent dusky-red swelling, dotted with small yellowish points, which had the appearance of pus, but when cut were found to contain a soft gelatinous substance. The eyeball was thrown considerably forwards, upwards, and to the temporal side, and its movements were much restricted.

The conjunctiva was red and œdematous, and filmed over with mucus. The caruncle, in the form of a large flattened tumour, protruded between the eyelids. The cornea was bright. V. = No. 19, J. at 8″. The swelling and hardness of the tissues ceased with a definite margin above, but below shaded off imperceptibly into the cheek. A director passed into the second incision ran with very slight resistance, as if through a soft tissue, along the inner wall to the apex of the orbit, and on withdrawing it the groove was found filled with a soft gelatinous substance, which was not more minutely examined, because no microscope was at hand. At 2¼″ bare rough bone was felt.

The left nostril was much obstructed, which, he said, had been the case for a fortnight. This appeared to be partly the result of an old injury, which, eight years before, had permanently bent his nose to the right, but mainly to proceed from a general puffiness of the mucous membrane, and from an adventitious growth, apparently a simple gelatinous polypus.

Two of our colleagues regarded the swelling as carbuncular cellulitis, and its close sequence on the blow seemed consistent with the opinion that it was inflammatory; but the character of the swelling of the lids, its colour and consistence, more particularly the sago-grain-like dots in the skin, and the great enlargement of the caruncle, reminded me so forcibly of what we sometimes see when the glands and skin under the jaw are rapidly infected in those exceptionally rapid cancers of the tongue which run their course in a few weeks, that I could not come to any other conclusion than that the disease in the present case was cancerous. It was evident, from the proptosis, epiphora, and epistaxis, that the morbid growth had already extended into the orbit behind the eyeball, and now also invaded the nostril, and that surgical interference, to be of any use, should be early.

Knowing my interest in orbital tumours, Mr. Wordsworth courteously transferred the patient to my charge, and, March 2d, I took him into the Middlesex Hospital, in order that I might watch him more closely than I could at Moorfields.

At a fresh consultation (at the Middlesex Hospital) most of my colleagues concurred in the view taken by two of the Moorfields Hospital staff. that the disease was inflammation of the cellular tissue, but one coincided with me that it was cancerous. It was agreed to watch the case for a few days longer.

I mention these facts to show the difficulty of forming a positive diagnosis.

Compresses soaked in goulard water were applied, and quinine gr. ii. were ordered to be taken twice a day.

March 6th. Since the last date there has been bleeding several times from an ulcerated spot in the caruncle; the first time it was only a few drops, but subsequently it increased to a continuous trickle. He was easier after the bleedings. He had now a worn, anxious expression; his nights were disturbed by a hacking cough, for which ether and henbane were prescribed.

March 9th. No more bleeding; his cough harasses him, causing much pain in the brow. The caruncle and lower eyelid are more swollen, and the hardness and redness have spread further in the cheek. An increased number of sago-like grains are now visible in the lower lid.

13th. The swelling is greater; he has more pain; a slight fulness is perceptible in front of the tempero-maxillary joint, and behind the angle of the mandible. Are these enlarging lymphatic glands? It had now become evident that complete extirpation of all the diseased parts afforded the only chance of prolonging, if not saving life, and the rapid rate of growth made it

equally plain that further delay was not justifiable. The patient, when candidly informed of his desperate condition and prospects, accepted the slight chance held out to him by surgical interference.

14th. Having put him under the influence of chloroform, I made a preliminary incision into the tumour, and a small piece having been taken from its interior, the microscope shewed it to consist mainly of large mono and poly-nucleated cells of an epithelioid type, which could not possibly be mistaken for any inflammatory product.

The diagnosis of cancer being thus positively confirmed, the eyeball was first enucleated (although not actually implicated, this was necessary in order to get at the intra-orbital part of the tumour behind it); the close adhesion of the tumour to the ocular capsule (O'Ferral's) occasioned a slight difficulty in doing this. The eyelids, and all the brawny part of the cheek and of the side of the nose, were encircled by a cut down to the bone, and rapidly dissected away. This done, I found the whole orbit filled with a soft, friable, succulent mass, which passed through a gap in the orbital floor, and nearly filled the antrum, without, however, having any connection with the walls of this latter cavity, the surfaces of which were lined by normal mucous membrane. This cavity also contained a little glairy mucus.

The tumour had also extended into the nose through the osplanum, and filling the back of the left nasal passage, projected in the form of a capsulated globular lobule through the posterior nares into the pharynx above the soft palate. (A soft simple polypus was taken from the front of this nostril.) In order to follow the tumour in this direction I had to cut away much of the maxilla, the left nasal bone, and the lateral mass of the ethmoid. It was now possible to detach the periosteum from the bones with a raspatory wherever the tumour appeared to have been connected with these latter, and when this had been done the bony surfaces were rubbed over with a hot iron. Strips of lint, spread with chloride of zinc paste, were applied to the entire wounded surface of the bone and soft parts. This completed the operation. The bleeding was very free, but yet less than I had anticipated, and had quite ceased before the zinc was applied. The enlarged ophthalmic artery cut at the apex of the orbit continued to bleed in spite of the cautery, but was stopped by a small compress dipped in liq. ferri perchlor.

The frontal sinus was opened in the course of the operation, and found not to be involved.

The limits of the tumour were much more extensive than I had anticipated, particularly towards the pharynx and the antrum, for the body of the maxilla was not expanded nor the palate depressed.

The minute structure was characteristic of epithelial cancer. The preponderating histological elements were large scale-like epithelial cells, closely packed in cylindrical masses and in concentric clusters. These, with a small quantity of fibrous, interstitial connective tissue, and blood-vessels, made up the great mass of the tumour in which no remains of the normal tissues were found; but along the line of extension where cancer was invading the normal tissues, there was a thin stratum of a new cell-tissue pushing out organoid buds among the normal tissues, and this new tissue consisted of small roundish cells about the size of those of the deeper layers of the rete mucosum of the cutis.

For some hours after the operation, I was anxious lest the fluids from the wound, saturated with chloride of zinc, trickling over the upper surface of the velum palati into the throat, might excite inflammatory œdema of the fauces and epiglottis, or perhaps poison the patient, but nothing of the kind occurred.

15th. Pulse 104; skin cool; tongue clean; slight swelling and redness of the edges of the wound and slight œdema of the right eyelids. His diet was strong beef-tea and a couple of eggs, and brandy ℥viii, but he said he had not enough to eat, and asked for a mutton chop, which was given him.

16th. Pulse 100; slept fairly; slight extension of the inflammatory redness. Complains of headache, which was relieved by a caoutchouc bag of

ice. It would be too tedious to detail the daily report, and from this time I shall only mention the leading points. The dry, hard, bark-like eschar formed by the caustic zinc was soon detached at its circumference by a narrow line of ulceration, which was quickly followed by cicatrization and shrinking, so that when the entire eschar fell away, April 11th, the wound was much smaller than at the time of the operation.

April 24th. At the upper and inner angle of the orbit, and on the septum nasi, the granulations are rather exuberant. Does this overgrowth arise from the irritation of small sequestra not yet detached, or does it mean a recurrence of the cancer?

Several sequestra were withdrawn from among the granulations, which subsequently assumed a more healthy appearance.

May 7th. The outer edge of the orbit is becoming loose.

23rd. A large hard fixed nodule has become palpable since the last note, behind the angle of the jaw. Three days later this had much enlarged.

29th. The loose edge of the orbit was lifted off.

June 1st. A fleshy knob has sprouted from the lower and outer part of the orbit corresponding to the spheno-maxillary fissure. The manifestly cancerous infection of the lymphatic gland, noticed on the 23rd, made it useless to destroy this. Both it and the gland behind the jaw increased, so that by June 8th he could not chew solid food, and could only separate the jaws to a very slight extent.

29th. Deglutition is now difficult. The tumour behind the jaw is very prominent, and its summit is soft and red; it is evidently about to break. The orbit is becoming filled with a growth from the outer wall.

In a few days the tumour behind the jaw broke and fungated, and from this time bled frequently. It widely infiltrated the neck, and from time to time large portions sloughed away, meanwhile the orbital growth made little progress. In spite of the frequent loss of blood and the profuse discharge from the wound, he survived till November 29th, 1866.

Mr. Arnott, our Surgical Registrar, has supplied me with the following memorandum of the post-mortem examination:—

"There is a large sloughy cavity in the place of the left orbit, which reaches deeply towards the pharynx, and outwards to the zygoma, while at its inner side are seen the remains of the septum narium. A protuberant, fungating ulcer reaches from the edge of this cavity to below the lower jaw. It involves all that remains of the cheek, and below it nearly as far as the collar-bone, the neck from the middle line, below the ear, nearly to the vertebral spines, is hard and swollen. The right side of the neck, below and behind the jaw, is similarly swollen in a less degree. The swelling proceeds from a cancerous growth which has destroyed the outer bony wall of the orbit, the part of the malar bone not removed at the operation, a portion of the ascending ramus of the lower jaw, and all the soft tissues in these situations. The sterno-cleido mastoideus muscle is lost in the centre of the cancerous mass, which pushes aside but does not structurally implicate the arteria carotis communis or vena jugularis interna. There were a few scattered knots of chalky tubercle in the lungs, evidently of old date, and with this exception the thoracic and abdominal viscera were healthy. No secondary infection of distant lymphatic glands was found."

In the progressive, continuous infection of the neck, and the absence of distant, interrupted infection, we see the same features which are so generally observed in epithelioma of the lip and uterus, which, while they infect the next lymphatic glands, are rarely accompanied by secondary tumours in distant organs. It is just this minor diffusibility which makes epithelioma less desperate than scirrhus, and brings it more within the scope of surgery. The longer average duration of life in epithelioma over that in other forms of cancer, 53 months according to Sibley, proceeds from the same cause. This case, lasting only about 10 months, was therefore an unusually rapid one, which make the postponement of the operation the more to be regretted.

Although operative interference in cancer of the eyeball or orbit is discountenanced as useless, or worse than useless, by some surgeons, these

constitute a very small and rapidly decreasing minority, and it is generally allowed that thorough extirpation alone offers a prospect of immunity from recurrence, relative or complete, whether the tumour be a carcinoma *stricte sic dictum*, or an infecting sarcoma. But here unanimity ceases, for beyond agreeing that thorough extirpation is only to be hoped for at an early stage, when the growth originates in the bones or in the periorbita, we found surgeons of the highest reputation not agreed as to the best way of operating, but practising different methods, some of which, from their very nature, involve the practical non-observance of that principle on which every operative measure should rest, viz., that it should be thorough for the particular end in view. Perhaps the chief reason of this is the supposition that the situation of the orbit, especially its nearness to the brain, does not admit of the same methods of operating as are advantageously employed upon the trunk and limbs; while a minor reason is the want of personal familiarity with the resources of general surgery by those who exclusively devote themselves to a special branch.

As far as I have seen and read, the two methods of removing orbital tumours in common use with us are excision of the tumour with knife or scissors, and its evulsion with blunt instruments. The first I have, till lately, always adopted myself, too often to see before long the tumour sprout up anew. Nor is this surprising, since diffusibility, infectiousness, is the leading feature of carcinoma, and in a scarcely less degree of some sarcomata; and the larger number of orbital tumours fall into one of these classes. The microscopic examination of the tissues around a cancerous breast, at points where neither touch nor unaided eye could detect any traces of the morbid growth, has again and again proved their already infection; and in an intraocular cancer, where the sclerotic appeared, on close scrutiny, to be entire, I have found the loose areolar tissue outside the eyeball, between the sclerotic coat and the capsular fascia, as well as that between the outer and the inner sheath of the optic nerve, to be microscopically infiltrated. It is therefore evident that the removal of those tissues only which are so grossly diseased as to be appreciable as such by sight or touch is insufficient, and that we ought to adapt to the orbit the maxim which enjoys the excision of a zone of normal tissue whenever we excise a cancerous or other infecting tumour seated in the trunk.

The same incompleteness inseparable in most instances from simple excision, belongs in a much greater degree to the practice of tearing out orbital tumours with blunt elevators. Cysts and encapsuled tumours may no doubt be entirely enucleated with these instruments, but an infiltrating growth, such as cancer, which has no distinct definite boundary, cannot be cleanly shelled out with them. Whenever I have seen them used the tumour has been torn in pieces, and so ragged a wound has been left that a suspicion, sometimes amounting to a conviction, that shreds of the morbid growth have been left has forced itself upon me. But if these blunt instruments are unsuitable for the complete extirpation of an infiltrating tumour, there is also an additional reason why they should not be used for this purpose. It requires so much force to wrench away the tumour from the orbital walls, that these latter may be inadvertently pierced, and the elevator or director plunged into the brain; or pieces of the roof of the orbit may be torn away without the operator being at the moment aware of the damage he is inflicting: both these accidents have actually happened.

The best method is, I believe, a combination of excision and escharotics. By clipping out the mass with a blunt-pointed scissors, curved on the flat, strong but not unmanageably large, and carefully exploring with the finger as we proceed, we avoid the risks incurred when elevators are employed. In this way I have safely removed both very tough and very friable tumours. When the orbit has been thus emptied, if its walls are anywhere compromised by the disease, the periorbita can be detached with an elevator or a raspatory, and as much of the bone itself as is necessary removed, and this safely, because the part acted on is directly under the finger, and the degree of force used can be exactly estimated, and its direction controlled.

This done, for the double object of stopping any bleeding vessels, and completing the destruction of any part of the tumour inaccessible to the scissors, the wounded surface should be touched with the hot iron, and when the bleeding has completely ceased, the operation is finished by coating the wound with lint spread with the escharotic zinc paste, the formula for which I gave in the last number.

The advantages of this escharotic are its manageability, the small amount of local inflammation, and the slight symptomatic disturbance which follows its use, even when it is applied to a very large surface. The depth to which it will bite can be regulated with some certainty by the thickness of the layer of the paste, and the eschar is a hard dry bark, the separation of which is followed step by step by cicatrization, so that by the time it is fully detached the wound is not unfrequently reduced to one-third or less of its original size. These characteristics of the zinc escharotic allow us to apply it to the orbital walls with more safety than any one who had not watched its use would be inclined to credit. Of this the case to which these remarks are appended is a good example. The practice was originated, as far as I know, in the Middlesex Hospital by Mr. Moore, and it has been adopted by Mr. De Morgan, Mr. Lawson, and by myself, in several cases with very encouraging results. In no instance has fatal intracranial inflammation been provoked, but I may not conceal that in three instances there was considerable excitation manifested by epileptiform fits a few hours after the operation. These, though sufficiently alarming, ceased, and did not recur. There is a disadvantage about which I must add one word. During cicatrization the eyelids are drawn into the orbit, so that an artificial eye cannot be adopted. No doubt this is a drawback, but one of little moment, seeing that the stake is life.—*Ophthalmic Hospital Reports*, Vol. v., Part iv., *p.* 336.

65.—ON THE USE OF ARTIFICIAL SUPPORT IN CERTAIN FORMS OF DEAFNESS; WITH CASES.

By Dr. Edward Bishop, Surgeon to the Ear Infirmary, Sackville-street, London.

The subject of appliances to the ear in cases of deafness attended by perforate membrana tympani is one of great interest. To Dr. Yearsley we are indebted for this addition to the therapeutics of aural practice; but the question of late has acquired additional interest from the enunciation of a fact which somewhat enlarges the sphere of their usefulness. Dr. Erhard, of Berlin, discovered that the wetted cotton remedy was of essential service to himself, although he had not a perforate membrana tympani, which had been set down by Yearsley as a sine qua non of its success. Erhard naturally directed his inquiries to the solution of the mystery; and during his investigations he discovered in the Museum of Pathology in Berlin, a preparation, in which there was a disconnection of the incus and the stapes, with a loss of the os orbiculare; such solution of continuity appeared to him conclusive as to the modus operandi of the cotton-wool in his own case, by the support it rendered in re-establishing the connection between the outer and inner membranes.

Those practitioners who have made aural disease a particular study, and have used artificial support in one form or another with success in cases attended with perforation, have, I doubt not, been led, like myself, to try its effects in obstinate cases where this lesion did not exist, and when successful have explained its operation as Erhard did. This explanation, however, and the consequent rational treatment founded thereon, has received additional confirmation lately. At a meeting of the Royal Medico-Chirurgical Society, in February last, the late Mr. Toynbee exhibited a number of specimens of the ossicula in situ, in which there was a disconnection between the incus and stapes; these specimens would have been more interesting and more valuable had he given their history, and been able to state to what extent functional derangement was coincident with structural

lesion; but without this it was evident that such a condition is a less uncommon *post-mortem* appearance than has been suspected. In a paper read at the same time he adopted the explanation of the modus operandi of artificial applications in these cases, as given by Erhard, and also by Yearsley in a paper read before the British Medical Association at Edinburgh—an explanation therefore of course by no means novel. It speaks well for the candour of the late Mr. Toynbee, that he should have thus set forth his altered views on this disputed point. The practical objection to his artificial membrane of india-rubber or gutta-percha is the distress and irritation it occasions; certainly it is difficult to abandon an ingenious invention, and therefore it is probable that Mr. Toynbee did not give in his adhesion to the simple and unirritating bit of cotton-wool, but advised the use of a small hollow globe of india-rubber filled with air as a substitute for his artificial membrane—thus imitating as far as possible, without abandoning the material, the original remedy as proposed by Yearsley.

The following instructive cases, I hope, will prove interesting:—

Case 1.—Miss M., of Canterbury, æt. 19, consulted me in August last. Her case presented the usual sad history of the ravages of scarlet fever. For several years she had been almost excluded from society, and her friends had quite abandoned the idea of treatment, as she had some years before tried Toynbee's artificial membrane, which caused such distress she could not use it. The left ear was completely disorganised, a considerable part of the temporal bone was gone, and of course nothing could be done. The right ear showed a perforation of the membrane, and there was a little discharge issuing from the meatus; she could not hear a watch when in contact, and the tick of a loud metronome was very indistinct. I inserted the wetted cotton support in the usual way, and immediatiately she could hear my voice, and enter comfortably into conversation. I dare not attempt to occupy your space by giving the details of this interesting case, but in less than a fortnight's time she could apply the cotton herself very well, and was able to join in general conversation with ease, and expressed all the delight of a person having so important a sense suddenly restored.

Case 2.—S. W., a tailor, admitted (Ear Infirmary, Sackville-street), July 6th, 1866. Very emaciated; deaf for the last ten years; for two or three years non-progressive, until recently, when he found himself much worse, and now is suffering from pain and singing in each ear, and is almost perfectly deaf, the eyes injected, skin hot, pulse 110. Ordered an aperient of calomel and colocyth, saline mixture, and three leeches to each ear.

9th. Relieved of all acute symptoms, tinnitus subsided.

13th. Is now as well as he has been for many years. Hearing distance (by watch) one inch, right ear, contact only left ear, both tympanic membranes white and pearly, no perforation, ear wax absent. Eustachian passages open, throat slightly sore, tonsils somewhat enlarged. Applied solution of nitrate of silver to throat, and used artificial support (wetted cotton-wool) on each side. The hearing was at once improved; he could hear the tick of the watch twelve inches away on the left, the worst side, on the right only about half of this distance; conversation he heard comfortably without much effort. In three weeks' time the patient could adjust the support himself, and can now hear the tick of the watch more than twenty-four inches from each ear. Can we account for the marked improvement in this case in any other way than that there was a disconnection of the chain of bones as they traversed the cavity of the tympanum?—*Medical Press and Circular*, *Dec.* 19, 1867, *p.* 627.

66.—CASE OF RESTORATION OF A PERFORATED AND COLLAPSED MEMBRANA TYMPANI.

By J. Hinton, Esq., Aural Surgeon to Guy's Hospital.

The following case is an instance of the facility with which, by the use of very simple means, a cure may be effected in a morbid condition of the ear,

which would otherwise, in all probability, be attended not only with more or less of permanent deafness, but with a perpetual liability to periodical attacks of inflammation and suppuration of the tympanum.

E. F., aged 8, was brought to me on the 25th of July last, with the following history:—Shortly after being vaccinated over a nævus on the arm, about the age of eighteen months, a discharge had been noticed from the left ear, and had continued with interruptions ever since; there had been none since May, when three or four blisters had been applied, as frequently before. She had had measles last year, not seeming to affect the ear; had not had scarlatina; deafness on the left side had existed from the first; but there had not been pain. The voice was heard on the left side only when distinct and near; watch four inches (heard on the right side at four feet). The left meatus contained a little old discharge, on the removal of which the membrana tympani was seen to be sunk inwards, in contact or nearly in contact with the inner wall of the tympanum. It was of a glistening white colour and irregular surface, the short process of the malleus strongly projecting; and behind it and a little below was a circular orifice, about a line in diameter, the edges of which were thin and appeared to be closely approximated to the pale and somewhat granular mucous surface behind. The patient could not pass air into the tympanum. The tonsils were large and the faucial mucous membrane swollen. Health good.

Two conditions here demanded remedy—1st, the orifice in the membrane; and 2nd, the alteration in its position. The latter indeed was in all probability the chief cause of the impediment to hearing, inasmuch as perforations of much larger size may exist with little diminution of that function. But the perforation first demanded treatment, because its closure afforded the only conditions under which a successful attempt could be made to bring back the membrane to its right position. This result could be obtained only by the agency of a stream of air introduced through the Eustachian tube, operating on the membrane from within, and requiring therefore that it should be perfect.

The new and simple procedure introduced by Pollitzer for inflating the tympanum with air afforded a means of effecting both objects. The plan of operation is the following:—The patient, being seated, takes a small mouthful of water, which he keeps in the mouth until at a signal given by the surgeon he swallows it. The surgeon, standing on his right side, introduces into the nostril of the side to be operated on a small flexible tube, and with his thumb and fingers closes the nostrils over it. This tube may be connected either with an india-rubber bag, or with the surgeon's mouth; in either case he forces into it a sharp stream of air, at the moment when, at the given signal, the patient swallows. The air then rushes up the Eustachian tube (opened by the act of swallowing), and in the great majority of cases, especially in children, overcomes any obstruction that may exist.

In the present case this procedure was employed to effect both the objects desired; first, to induce healing of the orifice; and secondly, to bring forward to its right position the collapsed membrane. The former object was gained by washing out the tympanum persistently by means of a warm solution of zinci sulph. (gr. iv. ad. ℥j.), to which the first gr. i. of hydrochlorate of morphia was added. The meatus was filled with the solution, and air then blown repeatedly through the tympanum in the manner described. By this means the solution was made freely to enter the tympanic cavity, and to coagulate whatever of viscid mucous discharge hung about its crevices. Sometimes a lotion of dilute acetic acid (℥j. ad ℥j.). was used in the same way. At the same time the throat was treated with a solution of alum (gr. v. ad ℥j.), by means of the atomizer, and subsequently by alum applied in powder to the region of the Eustachian tube; and in the course of a few weeks she was able herself to pass air into the tympanum, when the tube was gradually discontinued.

By the middle of October the perforation was healed, the surface being at at first of a pink colour, and soft fleshy aspect; but in two or three weeks

assuming the thin transparent appearance usual with scars of the membrana tympani.

During this time the hearing did not improve; but after the intermission of a fortnight, to allow time for the new issue to gain strength, the free inflation of the ear was resumed and carried out twice a week. Under its influence the membrana tympani could be watched gradually recovering from its sunken state, and regaining its natural position; its normal aspect and lustre also in great part returning. At the present time, December 10th, the appearance of the greater part of the membrane is almost that of health; there is, however, still an unnatural prominence of the short process of the malleus and thickening of the membrane around it, at the upper and anterior part also is an oval depression which does not yield to the pressure of the air. The scar of the perforation is just discernable as a darker spot surrounded by a whiter slightly thickened ring. The hearing has also gradually improved; the watch is now heard at thirty inches, and a whisper at ten or twelve feet.

I have reported this case because it shows the effect of very simple appliances, easily at the command of all, in relieving what might have appeared a very untractable lesion. Similar conditions are very frequent in children, and when detected, by examination with the speculum, they may be treated with the greatest probability of a good result. In the chronic and recurrent forms of "otorrhœa" in children, I have found the membrana tympani almost always perforated to a greater or less extent. The accumulation of mucus, more or less puriform in character, within the tympanum, which is exceedingly frequent in childhood, continually leads to rupture and partial destruction of the membrane; the tissues of the remaining portion appear, at the same time, to become soft and wasted, and hence it sinks inwards, yielding probably in part to the traction of the irritated tympanic muscles. This condition in after-life, when adhesions have formed and become firm, admits of but partial and tedious relief; and taken in an earlier stage, even though after the lapse of several years, and after all signs of acute affection have long ceased, it may yield a result as gratifying to the surgeon as it is beneficial to the patient.—*Medical Press and Circular Dec.* 19, 1866, *p.* 614.

DISEASES OF THE SKIN.

67.—ON THE DIAGNOSIS OF SKIN DISEASES.

By Dr. Tilbury Fox, Physician to St. John's Hospital for Skin Diseases.

[It cannot be denied but that few men ever attempt a careful diagnosis in skin diseases, and that errors in diagnosis when it is attempted are much more common than in any other branch of medicine. The following observations are offered as an aid in diagnosis.]

The mode of Onset.—It is not uncommon for the majority of cases to be preceded or even accompanied by severe constitutional disturbance; therefore, if there be much fever and malaise, especially where the patient takes to bed from a sheer feeling of illness, whenever rash begins to show we suspect something grave, one of the acute specific diseases probably. However, amongst the occasional exceptions, acute lichen, erythema nodosum, secondary syphilis, acute eczema, pityriasis rubra, acute pemphigus, urticaria, herpes zoster, and erysipelas may be named. Secondary syphilis has been mistaken for the mottling of typhus and measles, acute lichen for measles, and herpes zoster for pleurisy, on account of the pain. It is merely necessary to be aware of these mistakes to avoid them. This test is then important as the rule. When symmetrical, the disease is due, usually, to a blood-poison; when unsymmetrical, to local causes or affections of the nervous trunks probably.

Temperament.—We guess at a glance whether our patient is of full habit and likely to have a loaded system, especially the case in women; whether there

be organic disease, or if there be a dyspeptic habit, or an ill-fed system, that signifies debility. If *lymphatic*, we may expect eczema, impetigo, intertrigo, the pustular aspect of scabies, and ringworm; if *gouty*, the scaly diseases, chronic eczemas, and lichen agrius; if *rheumatic*, erythema nodosum; if *strumous*, eczema lupus; if *florid*, alphos especially. There is also the *cancerous* aspect, and in *nervous* subjects various hyperæsthesiæ engrafted upon ordinary eruptions, and so on. Red-haired subjects get pityriasis of the scalp.

We ask how long the disease has existed?

Hereditary diseases are—lepra, psoriasis, ichthyosis, lichen, eczema, and syphiloderma especially.

Congenital diseases are—syphilodermata, pemphigus, pigmentary, nævoid, and ichthyosis (scales).

Chronicity.—The more chronic a disease is the more does it tend to become a local disease; and this is the case with hereditary affections, hence in these cases *local* treatment is the most important.

Has the patient had the disease before?

Recurrence.—Lepra is essentially the disease which recurs, but syphilitic diseases also return.

Occupation.—Cooks get eczema and erythema, and lichen agrius about the backs of the hands, with bakers, grocers, and bricklayers; chimney-sweepers are liable to epithelioma of the scrotum; cotton-workers to urticaria; butchers and graziers to whitlow, boils, and malignant pustule; dragoons and shoemakers to an inveterate form of eczema in the fork of the thighs; young women who come from the country and have the full diet fare of the London servants, get an overloaded system that shows itself as erythema papulatum, erythema nodosum, or impetigo.

When did the disease first appear?

Age is very important. During the first six weeks of life congenital syphilis develops itself; intertrigo, eczema of the scalp, and seborrhœa capilitii; the congenital diseases of course show also. Syphilitic pemphigus occurs, it is said, before the child is six months old, not afterwards; during the first few months and up to and through the period of dentition, strophulus and eczema. One need only mention important facts. Cancer (epithelioma) is a disease of late life—not before thirty, about sixty; and rodent ulcer about the age of sixty and beyond. Lupus is a disease which commences in early and young life, and the same may be said of syphilis. The parasitic diseases occur in the young, rarely after twenty-one years of age. Herpes circinatis (or, as I call it, tinea circinata) is the form seen in middle life. In old people, prurigo, ecthyma cachecticum, pemphigus, and pruritus occur, with cancer and rodent ulcer.

Where did the disease first appear?

Seat.—On the *scalp* we have parasitic diseases, keerion, eczema, porrigo at the back of the head, sebaceous cysts, alopecia, and lepra; *ears*, eczema; *forehead*, lepra and herpes zoster; *near the eye*, chromidrosis, rodent ulcer, xanthelasma or vitiligoidea, molluscum; *face generally*, acne, impetigo contagiosa, erysipelas, lichen, syphilitic eruptions, erythema; *nose*, lupus hypertrophe, acne rosacea; *cheeks*, lupus, malignant pustule, acne rosacea; *upper lip*, impetigo sycosiforme, herpes labialis; *lower lip*, epithelioma; *chin*, sycosis; *whiskers*, acne sycosiforme; *angle of mouth*, congenital syphilis; *chest*, chloasma and keloid; *under clavicle*, sudamina; *about the nipples in women*, scabies; *in the side*, shingles; *outer* and *posterior* aspects of *trunk*, prurigo and lichen, as distinguished from eczema on the *inner* and *front* aspects; *elbows* and *knees*, lepra, psoriasis; *interdigits* and about *wrists*, scabies; *back of hands*, lichen and grocers' and bakers' itch; *palm of hands* alone, syphilitic lepra and erythema; *buttocks and feet of children*, scabies; *upper line of penis*, scabies; *scrotum*, eczema, psoriasis, and epithelioma in chimney-sweepers; *front of leg*, erythema nodosum, and in old people, eczema rubrum; *about the anus in children*, congenital syphilis; *generally over the body*, pemphigus foliaceus and pityriasis rubra; *in the bend of joints and armpits*, eczema rubrum; and limited to the *hair follicles*, lichen and pityria-

sis pilaris; and to these and the *sebaceous glands*, lichen scrofulosis and lichen rubra.

Our next query ascertains whether the eruption be *persistent* or *evanescent* (urticaria), developed pretty much at once (acute specific diseases, herpes zoster, herpes), or *consecutive*, as in most cases, *uniform* or *multiform:* the latter being the character of scabies and syphilodermata especially, and also seen in the complication of scabies by impetigo contagiosa; urticaria, and scabies or purpura; scabies and prurigo, eczema and scabies, eczema and lichen (eczema lichenodes), eczema and psoriasis seem oftentimes in the fork of the thighs and about the bend and front of the elbow. This fact of the intermingling of diseases is one of the most important to remember; to forget it is to lay oneself open to one of the commonest sources of error.

To scrutinise closely the character of the eruption to ascertain the *primitive elementary lesion*, is our next duty. In acute cases we have no difficulty; but in chronic instances it is frequently difficult, because the disease is often modified by *secondary changes*—brought about by (1) abortive development; (2) by treatment; (3) by the intercurrence and intermingling with other diseases as before mentioned. Most skin diseases employ the agency of inflammation in their operation; and this consists of redness (congestive), papulation (depositive), vesiculation (effusive), postulation, &c. Now some diseases only need the aid of the minor, others of the greater, of these; hence by abortive development a vesicular disease (eczema) may only reach the erythematous or the papular stage. And we must remember that our guides to the correct interpretation must be the concomitants in each case. The intermingling of two or more diseases requires to be kept in mind; and the effect of treatment is oftentimes to check secretion, and to produce an unnatural scaliness and dryness, so that a chronic eczema looks like psoriasis (lepra). The history, however, shows it to have "run" or discharged in its early days. *Scratching*, too, always induces additional inflammation, and flannel very much so. In chronic cases, we necessarily go to the newly developed part of the eruption to ascertain the nature of the elementary lesion—that is to say, to newly affected parts where the eruption is scattered and discrete, and to the edge of patches. In many cases congestion is augmented by deficiency of elimination, especially in regard to the kidneys. I believe our omission to attend to this is greatly to be reprehended, and in elderly people the effect of gravitation and retarded circulation is most potent. Many a case of eczema rubrum is exaggerated by, if its visible presence be not dependent upon, a deficient kidney action.—*Lancet, March* 2, 1867, *p.* 268.

68.—ON THE INFLUENCE OF FLANNEL AND SCRATCHING; AND ON MEDICINAL RASHES.

By Dr. Tilbury Fox, Physician to St. John's Hospital for Skin Diseases.

We are wont to say, "Familiarity breeds contempt." In no case is the truth of the precept better illustrated than in the therapeutics of skin disease. Oftentimes the simplest and most commonplace agencies, harmless in health, become active in the intensification of diseased conditions. This is the case with the *wearing of flannel* next the skin. We scarcely need more than a reminder of the fact that some skins are so irritable in health as to be excited to an unbearable degree by the use of flannel, to see that whenever there is a tendency to exaltation of the sensibility of the skin, this may not only be heightened by the flannel, but the flannel may also give rise to decided physical alteration. In a very large number of cases of skin diseases pruritus is intensified and the disease even protracted in this way, and in proportion to the degree of uncleanliness. Flannel acts mechanically by augmenting, or rather conserving, the local heat, and intensifying reflex action. *Practical rule:* When you have a congestive state of skin, or any disposition to neurosis, take off the flannel, and place it, if necessary, outside the

linen; this will prevent any "catching cold." The diseases in which this is advisable are, chiefly—erythemata, roseola, urticaria, certainly syphilodermata in their early stages, scabies, and prurigo. A remembrance of this little practical point will sometimes give us the greatest cause to be thankful that we attended to it, trifling though it be.

Scratching plays an important part in the modification of skin diseases, most of which are accompanied by itching; to relieve which, scratching is the natural topical application. What does it do?

1. When there is no eruption, it may produce one. For example, in pruritus, it gives rise to excoriations, an artificial eczema, general enlargement and turgescence of the follicles of the skin, with, perhaps, abrasion of the cuticle over and above them; wheals in a nettle-rash subject; ecthymatous pustules in the ill-conditioned. Of course in all these cases there is a basis to go upon—a tendency to the several diseases produced. Scratch a healthy person, and the local injury is soon remedied.

2. It augments and modifies existing eruptions. See in eczema how it inflames it, and increases the discharge and subsequent crusting; in lichen, the thickening of the derma. In scabies it gives rise to the peculiar "scratched lines" so characteristic of the disease, and many of the ecthymatous pustules; in prurigo, the peculiar ecchymosed apices of the papules, and helps out the coarse urtication.

3. When the disease is *non-contagious*, secretion, if present, may be transferred, and when acrid sets up local inflammation; and when *contagious*, scratching is the surest method of inoculation, as in the case of the contagious impetigo or porrigo. Children in this way transplant the disease from the head to various other parts of the body. Mothers, beyond a doubt, get it about their hands from children. As an instance of the effect of scratching, I may mention the case of a gentleman I have recently seen in consultation who has tried every remedy and doctor on the continent, taken the baths at Aix, and being treated by a large number of medical men in London for prurigo. He has taken drugs in any amount, and about sixty prescriptions were handed to me for my inspection. In this case which was of three years' duration, the itching was cruel, the whole skin reddened, thickened, dense, hot, and exceedingly appreciable of change; whilst almost every conceivable application had been used. My impression as to the influence of scratching turned out to be correct; and, by dint of perseverance, the patient avoided this source of irritation, and is now practically well. In this case, in which the least scratching was followed by general reflex irritation, the teachings of sound reasoning in league with clinical reminiscences put to shame that empiricism which is the curse of cutaneous medicine.

Medicinal rashes are important to remember. Hardy has especially noticed an eruption produced by the inunction of *mercurial* ointment. It is an erythema upon which vesicles form, and pour out a thinnish, clear fluid. The vesicles are quickly broken, the contents dessicate, and the redness remain for a week or ten days. It is clearly a local disease, and not a true eczema.

The *nitrate of silver* discoloration needs no further comment than this, that the silver seems to be deposited elsewhere than on the skin—the lining membrane of some vessel it is thought.

Arsenic is said to give rise to eczema. I have never seen this, but a lichen well developed about the face, neck, arms, and hands; and erythema of the palms of the hands, with violent fever, are sometimes produced. I am positive it can give rise to double vision by disturbing in some way the accommodation of the two eyes. It can also induce erythema, especially of the face, and a puffiness about the eyes,—I mean in small doses, and during its early exhibition; and it has happened to me to see the very best results in these cases from the perseverance in its use, notwithstanding these occurrences, provided there are no gastric symptoms. I have seen herpes zoster come on during its exhibition, and some think that it may give rise to this disease. I am not disposed to believe in any direct influence, but that out of the changes

that its use induces a condition may be brought about favourable to the occurrence of zoster.

Iodine produces erythema of the face sometimes, and local inflammation of course.

The friction of *croton oil* into the skin not unusually gives rise to an erythema of the face. I have been in the habit of using this topically and extensively for certain forms of dyspepsia, and I have often seen this erythema of the face symmetrical, lasting for a few days, with distinct heat, and this where there could have been no direct application of the remedy to the face.

Bromide of potassium may give rise to erythema and swellings of the nose; at least in one case this appeared to be its constant action, and in the experiences of those who have given the drug largely, an ecthymatus eruption; but this is probably due to its "lowering" or "liquefying" action, as in the case of *iodide of potassium*, which may induce purpura in a predisposed subject, and of course the erythema and other symptoms of iodism.

Belladonna produces a rash of rosy hue, fever, and a dry throat, with, of course, dilated pupils.

Copaiba, a rash well described by Judd in his work: a rosy erythema, of "pumiceous" aspect, as though the skin had been bitten by insects.

Arnica may produce erythema and swelling of the part to which it is applied.

Sulphur, in some cases, gives rise to a dry, red, dirty aspect of skin, with an attempt at the formation of vesicles, perhaps an artificial eczema, and subsequent pityriasis, accompanied by much itching; mistaken for the continuance or increase of the original diseases, mostly scabies, and demanding the most soothing treatment. The last case I saw was that of a gentleman who had had scabies; he was ordered a series of sulphur baths, which set up an artificial eczema, and ecthyma from the scratching, that rapidly got well (sooner than usual in these cases, for the sulphur impregnates the system) by demulcent baths and soothing unguents. Sulphur baths should be used with gentleness, and I think the old-fashioned villanous compound sulphur ointment less vigorously, for I feel sure that it is often continued long after the original scabies is cured, upon which the secondary effects, erroneously regarded as the thing to treat, depend. I have seen grievous errors committed from a want of attention to the facts I have pointed out.—*Lancet*, *April* 13, 1867, *p.* 454.

69.—ON THE TREATMENT OF VARIOUS SKIN DISEASES.

From the Medical Times Report of University College Hospital Practice.

Many very obstinate cases of prurigo of months' duration have been cured in a week by the use of an ointment consisting of half an ounce of olive oil, half an ounce of lard, and two drachms of the powder of Staveacre; at the same time more frequent change of linen, and care in the washing of it in boiling water, are enjoined. Four-fifths of the cases of prurigo senilis are found to depend on the pediculus corporis, and should be called phthiriasis. It nearly always attacks the shoulders and neck first, and subsequently spreads to the trunk and lower extremities. It is not exclusively confined to old people. Mr. Balmanno Squire has recently insisted on the fact that prurigo is commonly due to the pediculus corporis. It will be found that the older writers were familiar with the fact. Rayer figures the pediculus by the side of his plate of prurigo. It is a great gain to know that so distressing a malady has a local cause, as this knowledge saves the patient from drugs and leads to a more speedy cure. Scabies is believed to be due solely and exclusively to the presence of the acarus scabiei, one or more of which in nine cases of scabies out of ten which have not been submitted to treatment can be discovered at the end of the cuniculus. It is easily extracted on the end of a bent pin. The treatment is directed to the destruction of this parasite. Nothing is found so effectual as macerating the skin with soap and water, and the subsequent free inunction of simple sulphur ointment. If the cuticle

is very thick and hard, a little carbonate of potash, one part in twelve of the ointment, is added with advantage. Other means of treating scabies have been tried, such as the solution of the sulphuret of calcium used in Belgium; Hebra's ointment of sulphur, soft soap, huile de cade, chalk, and lard; benzole; solution of sulphate of zinc; solution of iodide of potassium, and sulphur baths. None of these remedies are equal, Dr. Hillier believes, to the old fashioned sulphur ointment.

For the treatment of ringworm (tinea tonsurans), a preparation composed of two drachms of iodine dissolved in an ounce of colourless oil of tar, is used with great success. It was first introduced by Dr. Coster, of Hanwell Central London School. This preparation is painted on the affected parts with a firm brush. It forms a cake, which separates at the end of a week or fortnight. It may require to be repeated once or twice, but not often more frequently. It causes little or no pain; is not liable to cause abscesses or destruction of the hair follicles, such as often result from deep blistering. The oil of tar is obtained by distillation from the common tar, and has a specific gravity of ·853. Good diet and tonics or cod-liver oil promote the cure, but they are not essential.

For the cure of favus, epilation is assiduously resorted to, with the use of sulphurous acid lotion, or an ointment containing sulphur and white precipitate.

For the cure of alopecia areata (tinea decalvans) local stimulation with tincture of cantharides or tincture of iodine is mainly used, whilst arsenic is often given internally. This drug is also used in the treatment of psoriasis, chronic eczema, and hemphigus, and less frequently in lichen and lupus. In acute eczema and psoriasis, antimony is given in doses proportioned to the strength of the patient and the amount of local inflammation, as a preparation for an arsenical course. In chronic eczema, with much thickening of the cutis, strong solutions of potassa fusa are painted on the affected parts. When there is not much thickening and not much crusting, tar is applied locally, either undiluted or with equal parts of glycerine, as recommended by Hebra.

Some dermatologists forbid the use of soap almost entirely in skin diseases. Dr. Hillier rather encourages its use, except in acute eczema, pityriasis, and herpes.

He does not consider that the same diet is adapted for every case of skin disease. This requires to be regulated according to the constitution of the patient. He does not think that all cases of eczema in children are benefited by an extra quantity of meat in their diet, or that nearly all skin diseases are traceable to debility.

One of the most important things in treating a skin disease is to ascertain whether there is any syphilitic character in it. In this case, small doses of the bichloride of mercury are given with or without an excess of iodide of potassium. In tertiary syphilis, the iodide of potassium is given alone. If the patient is very cachetic, it may be preceded by the iodide of iron. For congenital syphilis, grey powder is usually preferred.—*Medical Times and Gazette, Jan.* 12, 1867, *p.* 34.

70.—ON PHENIC ACID IN SKIN DISEASES.

[Mr. William Harding of Percy Street, Bedford Square, writes as follows:]

I am very much inclined to think that the liquor carbonis detergens owes its therapeutic value to the presence of phenic acid; but that is not now a question.

As to the mode or manner of using the remedy, that must be decided by the particular case and the judgment or fancy of the practitioner. I am accustomed to have the parts fomented with hot water, dried and washed over with the phenic acid lotion, which is prepared for me by Mr. Cooper, of Oxford-street.

I am "very sceptical of the value of new remedies;" but the action of the phenic acid has certainly sometimes surprised me, and what adds to its value and beauty as a remedy is the celerity of its relieving agency.—*Lancet, Jan.* 5, 1867, *p.* 33.

71.—ON PORRIGO.

By Dr. T. W. Belcher, M. A., Physician to the Dublin Dispensary for Skin Diseases.

[The first case may be shortly described as a well-developed one of porrigo, or favus, extending over a large part of the cranium, but being chiefly evident on the occipital hemisphere, the entire of which was covered by the disease.]

The treatment may be shortly given thus:—the scalp was first poulticed: the hair was cut off with a scissors as closely as possible; and the surface having been thus tolerably well cleaned, Hebra's tincture (described in my edition of Neligan, p. 114) was freely applied to it, and repeated poultices were superadded up to the 26th of January, when the disease was evidently much better. Tincture of iodine, prepared with methylated spirit, was now applied occasionally; and cod liver oil was taken in small doses until the 10th of February, when she was discharged cured. About two months after that date I saw her with a clean scalp, and a good, well-grown head of hair.

Case 2.—K. A., a girl aged 9, was admitted on the 14th of February, with the scalp affected much to the same extent as in the preceding case, from which, however, it differed in some important particulars. The disease was of a much worse character, and was accompanied by vermin, with which the child's head was literally alive. In order to kill these and to cure the disease, the scalp was well covered with Hebra's tincture, which at once accomplished the former purpose, and so clothed the scabs, that by diligent poulticing and the judicious use of the scissors the scalp was soon cleared off, and this was followed by the frequent application of the methylated tincture of iodine up to the 10th of March, when she was discharged cured. At the end of that month I saw her in as good condition as the preceding case. In this case the disease was said to have existed for six months previous to her first visit to me.

The *causes* of porrigo may be briefly noted. The disease is parasitic, but it requires a soil favourable for its production. This it finds in dirty, scrofulous, ill-fed children, among whom it nearly always occurs. In them it is not always confined to the scalp, and in some instances, when long continued, the patient gets an idiotic expression of countenance, and in fact the mental powers are more or less affected by it.

In one of the cases here noted pediculi were numerous. This occurs frequently in those who have a complication of this disease with a species of impetigo, or psydracious pustule; and the pediculi are mostly confined to the occipital hemisphere.

Diagnosis.—Porrigo has been confounded with neglected chronic eczema; and, according to Hardy, with impetigo, herpes tonsurans, porrigo decalvans, pityriasis, and psoriasis. From all these, however, a minute examination will distinguish the genuine disease, by detecting the presence of the favus, the honeycomb-shaped cup or *godet* of the French.

Prognosis.—This is a disease of serious import, not that it tends to shorten life, but its most unsightly aspect and contagious nature make it to be greatly dreaded, to say nothing of its effect on the intellect in long-continued cases. Besides, the hair follicles get destroyed, and permanent baldness is often the result. It is, however, very often cured.

Treatment.—The first thing to be done is to destroy the parasite, next to prevent its reproduction, and to this end constitutional as well as local remedies are specially adapted. In the cases here noted I have indicated what I consider the best mode of treatment, but I would not thence have it imagined that the many other modes pursued are useless. Various modes have been

resorted to to remove the parasite and the results of the disease. Among these I may shortly note the barbarous application called the pitch-cap and the process of depilation. The former was nothing more than closely fitting a pitch-cap to the patient's head, and then tearing off the hair with it. The barbarity of this practise was such that death has been known to result from it. I have seen a pitch-cap which was used in a case of porrigo, and I should never like to see one again. The process of depilation has been undoubtedly successful with some practitioners, but where it *can* be avoided it needs no argument to prove that it *ought* to be avoided.

The plan which I adopted in the two cases at the head of this paper combines, in my opinion, the advantages of the pitch-cap and depilation, without the shocking and cruel barbarity of the former.

With regard to depilation, I can easily conceive cases where it might be manifestly the proper mode of treatment, for in no class of diseases is special treatment for each case of more importance than in diseases of the skin. Even where two cases may be apparently similar in all respects, the treatment which may prove successful in the one may not only not be of any use in the other, but may bring the practitioner into positive disrepute with the patient's friends if unduly persevered in. Thus in two similar cases requiring constitutional treatment, arsenic alone may serve the one, and continually nauseate and half poison the other; while arsenic with quina may completely cure the second, and do no good, but rather mischief, to the first.—*Medical Press and Circular, Dec.* 5, 1866, *p.* 574.

72.—ON THE ETIOLOGY OF ECZEMA.

Dr. Frank Smith, of Sheffield, has recently made some very important observations in reference to the etiology of eczema in its relation to some disorder of the renal function, as shown by the presence of indican in the urine. In nine out of ten cases Dr. Smith has detected indican in pathological quantities. Indican is supposed to be due to a retardation of the process of declension from the complex to the more simple of the products of function and secretion. Its own highly complex formula is a strong evidence in favour of this opinion, in addition to the ease with which it is broken up into leucine, indigo, and glucine. Dr. Smith suggests that this retardation is due to accumulation of urea and other products of waste in the blood, owing to deficient renal secretion; for he has detected urea in considerable amount in the serum of eczematous patients. Indican occurs in the urine in the reaction state of cholera and in Bright's disease. The spectrum of the solution prepared from the urine for the detection of indican is the same as that of common indigo. These observations are exceedingly important and suggestive.—*Lancet, Feb.* 2, 1867, *p.* 156.

73.—ON REMOVAL OF NÆVUS BY ENUCLEATION.

By T. Pridgin Teale, Jun., Esq., Leeds.

[The following paper is an abstract of one read before the Royal Medical and Chirurgical Society.]

In this paper the author advocated two principles which have received as yet little attention from surgical writers in the treatment of the more formidable cases of nævus. The first is, that there exists in most cases of large nævus a distinct capsule, which will enable the surgeon to enucleate the tumour without cutting wide of the disease, and thereby endangering large blood-vessels or nerves. This principle is advanced by Mr. Paget in Holmes's "System of Surgery," vol. i., page 488. In support of it three cases are here related, in which the author, relying upon enucleation, had removed large and rapidly-increasing subcutaneous nævi in infants.

Case 1.—Emily R., aged 4 months. A rapidly-growing nævus, measuring three inches by four, situated over the right parotid gland, being chiefly subcutaneous, but involving the skin near the lobe of the ear, to the size of half a crown, removed by enucleation, October. 1863, the nævoid skin being preserved, along with the sound skin, as a cover to the wound. The knife was kept close to the investing capsule, and was used very sparingly in separating the deep parts of the tumour, which extended to such a depth that half an inch of the internal jugular vein was laid bare, and the finger could be placed upon the styloid process. Rapid recovery. Photographs of the tumour, and of the patient, two years after operation, were exhibited, as well as the tumour itself.

Case 2.—Alice B., aged 7 months. A rapidly-growing nævus, entirely subcutaneous, and measuring before removal four inches by three inches and a half, was situated over the left parotid gland. Removal by enucleation, January, 1865, the margin and deep surface being separated almost without using the knife. The infant returned home in ten days, convalescent. A few days after its return home it was seized with malignant scarlet fever, and died. A photograph and a preparation of the tumour were shown.

Case 3.—Mary R., aged 5 months. A nævus of the size of a walnut, chiefly subcutaneous, and situated over the right parotid gland, was removed in March, 1864. On the fifth day the infant died in a fit of laryngismus stridulus, to which it had been liable for some weeks before the operation. Tumour shown.

The second principle advocated in this paper is—that when a portion of skin covering a nævus is involved in the disease it is not necessary to sacrifice such diseased skin, as it may be dissected off the tumour, and, being retained as a cover to the wound, will gradually regain its natural appearance. This slow change is brought about by the gradual contraction of the internal cicatrix, by which the nævoid skin becomes united to the wound which it covers. It is an instance of the surgical value of the designed production of atrophy by means of cicatrix, a subject on which the author has collected many interesting facts, which he hopes before long to bring before the profession. This principle was acted upon in Case 1, in October, 1863, and in the summer of 1864 the preserved nævoid skin had recovered its natural appearance. Recently Mr. Nunn and Mr. Furneaux Jordan have carried out the same principle successfully in the treatment of nævus of the face.—*Medical Times and Gazette, March* 9, 1867, *p.* 264.

74.—ON OPERATION FOR NÆVUS.

By Furneaux Jordan, Esq., Birmingham.

Where the skin is not greatly or at all implicated, I make an incision through it, and completely through the nævus—dividing it into two halves. Hemorrhage is easily arrested by pressure at one or more points within or external to the incision; then each half of the tumour is cut out piecemeal with curved scissors. The partially-implicated skin will in time become natural. The cure is effectual and rapid. I have found it to succeed when all other means have failed. The cicatrix of the single incision soon becomes almost imperceptible.—*Lancet, Dec.* 1, 1866, *p.* 618.

SYPHILITIC AFFECTIONS.

75.—ON SYPHILIS.

By Dr. Samuel Wilks, Physician to, and Lecturer on Medicine at Guy's Hospital.

[In the following article, which is an epitome of a lecture delivered at Guy's Hospital by Dr. Wilks, syphilis is only considered in the light of a consti-

tutional affection. It is of the utmost importance that it should be so regarded, for the neglect of so doing has been the main cause of the obscurity which has so long surrounded it. The disease is not necessarily venereal in its nature, nor is it always local in its origin.]

The virus of the disease may be introduced into the system without any affection of the genital organs, and without sexual intercourse, and, indeed, without any primary lesion whatever. I believe that any obscurity which has hung over the disease has been due to this erroneous way of regarding it, and which still seems to veil the truth from many. We shall see that syphilis, being a constitutional disease, is introduced into the system by a virus; but this by no means need be gathered from sexual intercourse: it need not be introduced through the genital organs, nor by any sore at all. At the same time it must be remembered that there are probably many local affections having irritating discharges which are highly contagious, and yet do not contain any virus which is capable of contaminating the whole system. I have seen an impetiginous sore on one person produce a similar sore on another; but how absurd would it be to confound this with a constitutional affection, and style both by the same name.

I say for a long period all contagious sores found on the genital organs were styled venereal; but it is evident that many of them were simply local in their character, whilst one alone contained a poison which was eminently virulent. Syphilis is a disease *sui generis*; it is just as peculiar in its symptoms and results as is scarlatina or small-pox. It has, like them, its incubation, its febrile disturbance, its eruptions, and sequelæ.

Syphilis, having generally a primary local lesion, was regarded too frequently as a simple external disease. I am aware that so-called secondary symptoms were observed, but this was not sufficient to compel practitioners to separate syphilis from simple sexual affections. Indeed, when the matter was considered at all, it was declared that the secretions and blood of the syphilitic patient were not contagious. Be careful, then, not to be led into the error of treating syphilis from a purely surgical point of view, as is sometimes heard in the question as to the best applications to the sore, as if the sole object was to heal it up, without any regard to the virus which is being absorbed. To consider the one without the other may be as absurd as the consideration of the best method of healing a bite given by a dog which is affected with rabies. With syphilis, how to treat the chancre has been a subject by far too long exclusively considered.

Now, in speaking of other specific diseases, you may remember that there were certain leading features in them which engaged our attention. By "specific" diseases I intend those which in no way depend upon the slow changes in the tissues brought about by long-continued causes, and which constitute the great bulk of all diseases which come before us, but I allude to morbid conditions of an altogether different kind, and set up in the most healthy person through the introduction into his blood of a virus taken from another who is suffering from the disease. A process is supposed to be set up in the blood, which has been regarded as fermentative, and thus called zymotic; that a definite period is required for the change; that certain phenomena ensue, and the process then ceases (some think by the elimination of the poison), leaving the subject as well as before. After the poison enters the system, a certain period elapses, in which no outward sign of its presence is seen; this is called by the nurses the "breeding time;" by us the "hatching time," or the incubation; then the febrile symptoms appear, attended by a disturbance of the skin and mucous membranes, and it is especially by the altered appearance of the skin that the differences of the specific diseases are characterised.

As regards the disease now under consideration, the first thing to inquire is as to the mode of introduction of the syphilitic virus into the system, the changes which then occur, and the incubation. Of course the poisonous matter from a so-called primary sore can be conveyed to another person; but one question which was asked by the Venereal Committee (of which I

was a member) of the witnesses was, whether an excoriation was necessary for its introduction. There were those who thought this was necessary, and that in all probability, a breach of surface took place on the mucous membrane, through which the virus was taken up. Other witnesses said that, there being an absence of all proof of this, they had no reason to believe otherwise than that the virus might enter the follicles, and be absorbed by lymphatics or veins. It seemed, however, to be believed by a third and large party that both doctrines were admissible—that although a raw surface would allow more readily of absorption, yet that the application of an irritant virus to the sound skin or mucous membrane would in time so alter the epithelial surface that absorption would then readily take place. This conviction was founded upon what is observed when various medicaments, such as aconite or belladonna, are applied to the skin; besides there were the positive experiments of Ricord, who showed that although a long time might elapse, yet that the virus would act eventually on a healthy skin, after having, of course, completely soddened the epithelial covering. If experiments be made with the virus, what mostly happens is the following: that, as in vaccination, the puncture heals; soon a papule appears, which is surrounded by a hardening, producing a lump or button, which is almost characteristic of the disease. This process generally takes three or four weeks or more; the average time is a month. When the patient first perceives a sore, he has already had the poison within him for a month. You may remark that the longer a specific disease is developing, the longer is its whole duration, as well as the various stages, including the onset of the fever and that of the rash. A disorder like scarlatina, which runs a very rapid course, has a short incubation and a rapid fever stage, the rash appearing after twenty-four hours' illness. In small-pox the fever stage is longer before the rash, so also in typhus; whilst in typhoid, a disease of longer duration, the pre-exanthematous stage is more protracted. In syphilis, a disease which continues over a long period of time, the incubation is slow, as well as the stage preceding the efflorescence. Dr. Marston, of the Artillery, has stated that the soldiers very generally said that a month had elapsed since intercourse before they observed the sore; in one case he had known fifty-six days to elapse.

The mode of introduction of the virus and the effects produced are of the highest importance and of great interest, both practically and pathologically. The true or characteristic chancre is that where an induration occurs around the chancre, and the neighbouring glands are involved; but we know that this is by no means necessarily the case; that soldiers and sailors (and this is the experience of all medical men) will occasionally draw attention to secondary symptoms who exhibit no evidence of a local sore, or, perhaps, merely a cicatrix or a papule, but attended generally with indurated inguinal glands. Such cases do occur, I say, but they are exceptional.

In corroboration of some of these views, not drawn from books, but from the mouths of living witnesses, it was said by Dr. Beith that the virus might enter through the cuticle without abrasion; Dr. Blenkins, of the Guards, believed the virus might be absorbed by the follicles. Dr. Frazer, who had had a very large experience in India, had seen sores heal at once; or, perhaps, there was a mere scratch, which healed immediately, but was followed by the usual secondaries. In cases which followed supposed gonorrhœa, he believed there was a crack or sore which had been healed. It was for this reason that he relied more on the induration of the gland as a diagnostic mark than upon the character of the chancre. Mr. Samuel Lane, also, had seen the constitutional affection where the only local sign of disease was a little excoriation, and which, healing up in a few days, left no sore and no induration. This would be somewhat analagous to the case of hydrophobia succeeding to the bite of a dog which was little more than a scratch, and which had soon healed.

Now, I have first mentioned these facts to show that the virus of syphilis may be introduced into the system through the most trifling abrasion, and leaving at the spot no trace behind. Such cases, however, are exceptional, since the induration is generally observed at the point of introduction of the

virus, and which condition is intimately related to the further development of the disease. The great peculiarity of the syphilitic process is seen in this disposition to the production of lymph or fibro-plastic material, which may in extreme cases of disease, as we shall presently see, find a nidus wherever connective tissue naturally exists—that is, in every part of the body. The first indication of this is seen in the chancre itself. There can be no doubt, although authorities differ as to its absolute necessary presence, that induration is the great characteristic mark of the true syphilitic or Hunterian chancre. It may be admitted that it is sometimes wanting; but the well-marked mass of indurated tissue which is sometimes seen on the prepuce, much like an everted eyelid, is too striking a fact to be overlooked. Herein, indeed, lies the first evidence of the true nature of the disease; but mark the fact, that although this is called a chancre, thus implying the existence of a sore, yet no ulcer need exist. The surface merely secretes an ichor; but there is no pus, nor, in fact, is the mucous membrane over it absolutely destroyed. If a sore does exist, it is generally an after occurrence; it is no necessary part of the syphilitic process. Babington, the commentator of Hunter, says the character of the primitive venereal affection is essentially an induration passing afterwards into ulceration. Well, then, this indurating process goes on for three or four weeks after the introduction of the virus, subsequently an induration of the glands in the groin ensues, and then follow the constitutional or secondary symptoms.

Before, however, proceeding further, and leaving the subject of primary sore and contagion, I had better here allude to another probable mode of contracting the disease—that is, from a person in whom the affection is already developed, or who has the secondary symptoms, the primary having long disappeared. The prevailing opinion has been, that contagion could only occur from the primary sore — that is, for the first three or four weeks of syphilis; and when this had healed no longer was contagion to be feared. There is, however, at the present day, a large mass of evidence to show that the constitutional disease is contagious. For instance, there are great many prostitutes plying their trade in whom there is no existence of a sore, and yet these women are largely propagating the disease. Theoretically, you would suppose that although the primary sore had healed, yet, as the poison was still working its effects on the constitution, that it could be communicable to others; Hunter thought so, but failed to prove it. Experiments have been made which prove positively that the blood and semo of the secretions are poisonous in the secondary or constitutional disease. Diday speaks of the frightful ravages of syphilis in a country village, introduced by a syphilitic infant, and propagated by the nurse; but I think I cannot do better than quote the opinions of witnesses from whom I have heard the facts orally. First, there was a surgeon who accidentally cut his finger whilst operating on a man suffering from secondary symptoms, and who himself, in consequence, took the disease. This surgeon gave it as his opinion that women go on infecting men long after the primary sore has healed. Dr. Marston believed, also, that the discharges of syphilitic women were contagious. Of the same opinion were Mr. Erichsen and Mr. Samuel Lane, Mr. James Lane, and Mr. Gascoyen, of the Lock Hospital. Mr. Langston Parker had no doubt that the discharges of women produced the disease in the other sex; but he stated, still more, his belief that they would produce sores of an indurated kind. He had seen constitutional symptoms thus conveyed, just as from men to women by means of the seminal fluid. Mr. Lee described some time ago, in the Lancet, how a gentleman came to him with a chancre, saying it was impossible he could have syphilis, as he only knew one woman, who was free from disease. She underwent an examination, and the mucous membrane was found healthy, although she had a discharge. On examining the chest a syphilitic rash was seen. Mr. Lee opined that from long intercourse this gentleman had not been infected, until, from some local irritation on the parts of generation, a secretion was formed which was inoculable. In the same journal there was circumstantially related the case of a man labouring under secondary syphilis,

and having a sore on his lip, biting another man, and conveying to him the disease. So much for the secretions; but the blood itself is poisonous, or it may be that herein lies the virus.

In a work lately published by Lancereaux, there is a narrative of a case of inoculation by the blood on a medical man who voluntarily submitted to the experiment. The champion (to adopt the author's expression) was an Italian physician, Dr. Bargioni. The patient who afforded the material for experiment was a woman, aged twenty-five, the subject of well-marked constitutional syphilis. Her arm was washed clean, and no eruption existed on that part. The cephalic vein was opened, and some blood was drawn; lint was dipped in it, and applied to the arm of M. Bargioni, in which three incisions had been made just below the insertion of the deltoid. In twenty-four hours the lint was removed. In four days all trace of the inoculation was gone. After a few days he noticed an itching, and on looking at the arm there was observed a round papule of a red colour, but no induration around it. The papule gradually increased, and in eight days was of some size, and covered with a silvery scale. Eleven days after its first appearance, two glands in the axilla became enlarged. On the sixteenth day these glands were larger; and on removing the scab from the papule, a small quantity of serosity was found beneath, but no induration around it. On the eighteenth day there was an ulcerated surface with a crust on it, and a certain amount of hardness at its borders. On the twenty-third, it was larger and harder, as were also the glands. A month after the first appearance of the papule he had nocturnal pains in the head, and observed some enlargement of the cervical glands. A week after this a roseolous rash appeared on the body, and spread all over him, leaving no doubt as to its nature. In another week the sore was not yet disposed to heal, and the glands were larger. The rash then became copper-coloured. Mercury was given, and the sore began to heal.

There can be no doubt, then, of the fact of the blood of a syphilitic patient being poisonous, and capable of conveying the disease to another person. The experiment has now been more than once unfortunately and unwittingly tried in the case of transmission of syphilis during the operation of vaccination. I am not aware of any experiments having been made with the blood of a patient who had only the so-called primary disease. Knowing the fact, all we want to ascertain now is the frequency of the propagation of the disease by means of the blood or certain secretions, so as to speak with certainty as to the propriety of including women suffering from secondary symptoms amongst those who are now arrested under the recent Act of Parliament.

Supposing then that the virus from a depraved secretion or blood of a person suffering from secondaries has entered a particular part of the body, what change is there locally produced? Now I am sorry to say our facts are scanty as regards this matter, and few of our witnesses at the Commission could give me much information. In the case of the Italian physician just mentioned, you see there was no marked indurated sore, and thus it is possible that the virus from the two different stages of the complaint may produce different local effects. Diday maintains that syphilis may be propagated either from primary or secondary, and that the latter contains a less virulent poison. It is syphilis in a milder form; but we have heard Mr. Langston Parker declare that he has seen an indurated primary chancre arise from a secondary source. There cannot however, be left out of the question the seat of the primary lesion, which appears to have somewhat to do with its character, seeing that indurated chancre is comparatively uncommon in women.

In considering the syphilitic constitution, the *liver* must retain its pre-eminence, both as the organ most commonly affected and the one in which an alteration was first discovered in connexion with the disease. It may be remarked too that hepatic disturbance and jaundice have been noticed in the course of syphilis by many of the more ancient writers. There are *three* varieties of the syphilitic liver: the first, that in which the whole organ has

become infiltrated by a new fibre-tissue, producing a uniform and general hardening; the second, in which the presence of the new material in the course of the portal vessels has produced a contraction like that of cirrhosis; and the third and most striking form, where the organ is pervaded by distinct nodules of the new formation. The *first* variety has mostly been observed in children who have died of hereditary syphilis, the organ being large and intensely hard, all natural structure having disappeared to the naked eye, and the microscope showing the organ pervaded throughout by the adventitious material. The *second* form is constantly seen in those bodies which are tainted by syphilis, and is often found associated with the lardaceous degeneration. Inasmuch as the patient may have been intemperate in drink, the change may have been wrongly attributable to alcohol. In many cases, however, judging from the history of the case, and the morbid appearances found elsewhere, I have been pretty confident that syphilis was the origin of the disease. It may go on, like alcoholic cirrhosis, to produce dropsy, as was seen in a man lately in the hospital, and who required to be tapped several times before his death. The *third* form shows the most characteristic changes, and those which are generally pointed out as evidence of the presence of syphilis. Here are seen distinct nodules scattered through the substance of the organ, sometimes as small as peas, and at other times as large as walnuts. These after a time become dried up, and then form tolerably circumscribed masses; but the neighbouring tissue is often infiltrated, and then they send out long processes into the neighbouring hepatic tissue. When near the surface they shrink up the tissue, causing deep cicatrices, so that we may constantly meet with a liver much altered in shape, or apparently lobulated, from the effects of syphilis which had occurred several years previously.

The *brain* is an organ which is perhaps not quite so often affected as the liver; but owing to any disturbance within it at once becoming manifest and productive of symptoms, its alteration by syphilis are infinitely more important; some of the worst forms of epilepsy, and most fatal, being assignable to this cause. Observations have hitherto shown that the membranes and surface are more liable to disease than the substance, unless indeed various affections of the cerebral tissue, which have hitherto been ascribed to other causes, have their origin in venereal disease. As regards the membranes, the before-named syphilitic deposit may be found on the external surface of the dura mater in connexion with the bone, and at the same time on the internal surface in connexion with the convolutions. The latter may be altogether independent, as it is the more important. It is seen as a patch of indurated lymph on the inner surface of the dura mater, whereby the membranes and brain become closely adherent. The cineritious structure is involved, and perhaps a portion of the medullary. This is the most common and striking form of disease produced by syphilis, and the one which is generally found in connexion with epilepsy and some other well-marked cerebral diseases. As regards the brain proper, I have only once or twice seen distinct deposits within its structure. These were small, and scattered through the cineritious portion. It is probable, however, that many of the so-called fibrous tumours may have been syphilitic, and also that some instances of softening may have been due to the breaking up of similar deposits. Softening of the brain, however, may occur from syphilis in another way, simply from deranged nutrition, owing to disease in the blood-vessels. It has been shown that in several cases changes have occurred in the arteries by a fibroid thickening in their walls, exactly of the same nature as is observed in other structures of the body. The consequence is a ramollissement of the cerebral substance.

The *spinal cord and nerves* may be affected by syphilitic disease. The nerves may have syphilitic tumours upon them, producing the peculiar affections which the loss of function of those nerves would necessarily bring about. In one case a spinal nerve was affected, and productive for some time of neuralgia: but as the deposit increased, the cord became involved, and a fatal paraplegia ensued.

We next come to the *lungs*. It is possible, and indeed highly probable, that these organs are very often seriously affected by syphilis, and that much of the so-called phthisis which occurs in persons of intemperate and debauched habits has had its origin in syphilis. As in other organs, the syphilitic affection may occur under two forms, the nodular or the diffused.

[In the *testis* syphilitic deposits occur as distinct nodules, or a fibrous structure may be seen running through the parenchyma in connection with the tunica albuginea.]

In the same manner the *mamma* may be affected. I have not much personal experience of this, but it seems that the female breast may be affected in three ways. One variety of the affection is that in which a mass of indurated tissue is associated with an ulceration of the integument; another in which distinct masses are found in the gland; and a third in which the new material is diffused through it, constituting a syphilitic mastitis.

The *muscular system* was a part of the body always known to be affected by this disease, inasmuch as the tongue is a muscular organ, and nodules in its substance have been remarked by the earliest writers. The same may be observed of the muscles of the limbs, and thus hard lumps of fibroid tissue are not unfrequently met with in the forearms and legs.

The *bones* are constantly affected, as you know. In the first stage of syphlis, we speak of periostitis affecting especially the tibia, forming a painful node, which is again absorbed by appropriate remedies, there being no disposition to the formation of pus. Remark that there is no great distinction between ostitis and periostitis. The vessels of the periosteum throw out lymph, and thus it may be found in abundance beneath this membrane; but it may also be found filling the canuliculi of the bone. If this be not absorbed, an induration or actual ossification takes place, and the bone becomes permanently enlarged. It is only under peculiar circumstances, from a low state of health, protracted use of mercury, or from an ulcer forming on the skin, that a softening process may take place, and caries result. On the flat bones, as the skull, a process goes on in the bone which much resembles what is seen on the soft tissues, as skin or mucous membrane; the carious surface or ulcer having raised edges, with a puckering of the tissue around. Virchow has made this a study, and has styled it dry caries, and of which you may see many specimens in our museum. There are starlike spots and linear cicatrices on the bone. Where a portion of superficial plate has been removed, a deposition of new bone has occurred around, so that the surface looks puckered and raised. It has a worm-eaten appearance, with dentated edges, and on the skull before me you see the star-shaped cicatrices.

How far in a pregnant woman the structures connected with the nourishment of the *fœtus* may suffer from the effects of syphilis has not yet been determined with scientific accuracy. The still-births and the abortions by women affected by this disease are too common to require notice. But in these instances the cause is in the fœtus itself; it is diseased, dies in utero, and is thrown off. But miscarriages are by no means infrequent in tainted women, even when the fœtus itself shows no signs of disease. In such cases it has been conjectured that the *placenta* has been specifically affected, and in illustration I can point you to specimens where this organ contained deposits of a supposed syphilitic nature. In corroboration of this, Dr. Barnes informed us at the Venereal Committee that syphilis produced a diseased condition of the mucous membrane of the uterus, and thus gave rise to abortion. There was a chronic inflammation of the mucous membrane which went to form the decidua, and the placenta which arose from this being the organ through which the fœtus received its nourishment, the latter naturally perished.

The effects of *hereditary* syphilis on the system are somewhat different from those which I have described when the disease is acquired. Children who are born syphilitic are recognised by their impoverished look and by the morbid condition of the skin. On post-mortem examination the liver may be found indurated, the lungs the subject of lobular pneumonia, and a peritonitis may exist, as first pointed out by Sir J. Simpson.

When less severely affected, syphilitic children do not exhibit traces of the disease until some weeks after birth, when a roseolous or lichenous rash appears, accompanied by snuffles, ulceration about the mouth, condylomata, &c., and perhaps some inflammation of the structures of the eye.

In about a twelvemonth these children get well, and until quite lately were supposed to be then altogether free of the syphilitic taint. It was supposed that hereditary syphilis was a purely infantile disorder, and that all traces of it disappeared after the period just named. It has, however, been shown by the long-continued and very accurate observations of Mr. Hutchison that the disease by no means ends here, but after a few years its effects may again be witnessed, in a manner which has just been described to you, in the tertiary stages of the acquired disease. but still possessing some peculiarities. The novelty of the observations consists in the fact that a person may be suffering from the effects of hereditary syphilis in adult age, and at a period when it is possible he may acquire the disease for himself. In such cases, however, not only are the morbid processes seen in action, but the effects of those which occurred in childhood have left their indelible traces on the countenance. Thus, in a young person, say at the age of puberty, a syphilitic action may be found still proceeding, although engendered at birth; and the subject very often exhibits the hereditary taint in his person. He is often puny or ill-developed, as was seen in two young men who were lately in the hospital; although in a girl who evidently was the subject of hereditary syphilis the general conformation was good. These puny lads had the configuration which Mr. Hutchinson has so well described. There was the protuberant forehead, indicative of the ventricular effusion which had occurred in infancy; the peculiar flattening of the nose, induced by the inflammation of the mucous membrane and periosteum; the puckering around the mouth, from cicatrization of former ulceration; and, above all, the peculiarities presented by the teeth. Owing to the pulps of the permanent teeth having been involved in the inflammation at an early period of childhood, the formation of the teeth becomes altered, seen especially in the incisors; these are dwarfed, rounded, narrowed, and notched. With regard to the teeth, you are no doubt aware that much scepticism exists as to the correctness of the observations that have been made and therefore I may remark that, having had my attention early drawn to the subject by Mr. Hutchinson, I have taken many opportunities of testing its truth, and I have not the slightest hesitation in giving my adhesion to his views in every particular. Not uncommonly the shafts of the bones are found of inordinate size, from the chronic induration which has been for many years in progress. Besides these marked effects of former morbid processes, we may find that the fire is still burning, that ulcerations may occur in the throat, that a fresh periostitus may break out, and at the same time an affection of the eye which appears to be peculiar to this form of hereditary syphilis. It is seldom seen before the fifth year, and consists of a cloudiness coming over the eye, due to an infiltration of the cornea with lymph, and which is technically styled "interstitial keratitis." Sometimes also the patient may be deaf. At a later stage these patients come before us with dropsy and albuminuria, and we find they are the subjects of the lardaceous disease before mentioned.

Now I would have ended my subject here, and not touched on the question of *remedies*, had they not thrown further light upon the nature of syphilis. I have already said that syphilis is a specific contagious disease, and that in not a single example of the class to which it belongs have we any knowledge of a remedy properly so called. Each runs its course, be it typhus, smallpox, or cattle plague. As regards syphilis, the only remedies which have ever been regarded in the light of curative agents have been mercury and iodide of potassium; and most men of experience are agreed that these remedies do have a most marked effect in removing certain veneral symptoms, and in producing for a time an apparent cure. At one time, no doubt, mercury was looked upon in the light of an antidote; but, from a better knowledge of its action, its influence appears to be exerted merely on the general secreting apparatus of the body, and so, by promoting absorption, assists in

getting rid of many of the morbid results of syphilis. Similar effects of the drug are seen in the removal of a bronchocele, enlargement of a lymphatic gland, or a pleuritic effusion. Iodine and potash have also analogous effects. When, therefore, a node is removed from a bone, it is probable that an absorption of the new material takes place, but that the drug administered has no influence over the cause producing it; thus it is that after a short time a relapse takes place, and the same symptom occurs again. It would seem, then, that our best remedies—as those just named—have no influence over syphilis itself, but only over its effects. A practical lesson here follows, which I have often adopted with the best success: instead of considering that mercury is a remedy for the earlier stages, and that at a later period tonics are required this drug may be found useful even when the cachectic condition of the patient would have rather contraindicated it. I have several times witnessed the good effects of more active treatment in patients whose condition had suggested, merely wine, quinine, cod-liver oil, and such-like remedies, but where a true syphilitic action was still in operation.

The witnesses on our committee, with few exceptions, were mostly of opinion that mercury was a valuable remedy, but not curative, of syphilis. It might modify results, but not prevent them. Such opinion is probably generally held. Thus Ricord says: "Le mercure fait disparaitre les manifestations actuelles; il ne neutralise pas la diathèse." And Welbank before him: "Mercury antagonises the influence excited by the syphilitic virus; but is no specific antidote to the virus itself, which must be gradually modified or eliminated by the system at large." I may now add, that Hunter held the same views. It is very remarkable how Hunter appears to have been misunderstood in this matter. He is often quoted as an advocate for the extensive use of mercury as a specific remedy. He uses merely the term specific in the sense of its having an influence over the disease in an unknown manner; but he labours hard to show that the drug in no way removes the cause, whilst it for a time influences the effects. I cannot but think that the obscurity of his language was caused by the very comprehensive grasp which he took of the subject, and which was consequently not appreciated by many of his readers. The very expressions which Hunter used clearly show, I think, not only his correct view of the whole subject of syphilis, but how he has anticipated the doctrines of the present day.

I cannot dismiss the subject of mercury without making reference to an opinion often expressed, that many of the results attributed to syphilis are really due to mercury; and in illustration those wretched examples of tertiary disease are pointed at, with necrosis of bones and other organic affections, and who very frequently have taken much of this drug. Now, in order to decide to which the effect is due when two causes are in operation, it is necessary to watch the operations of each singly. In the first place, it has been proved over and over again that every effect which has ever been attributed to syphilis has been observed where not a particle of mercury has been taken; and in the second place, in those who are poisoned by mercury the peculiar and characteristic effects of syphilis are never seen. Moreover, a consideration of the operation of the two substances, the syphilitic virus and mercury, upon the body, will remind us that the effects are not only different, but opposed or antagonistic. The one is disposed to cause the formation of a fibro-plastic matter, the other to absorb it; the syphilitic is a formative process, the mercurial is a destructive one. If, then, it be stated by men of experience that the worst forms of disease are those where mercury has been given, it can be explained only on the supposition that the remedy was never needed or was given in excess. If, for example, mercury has caused the absorption of lymph in a bone, and still be continued, a disintegration of tissue might commence, and mercury be justly accused as the fomentor of the process; but this is a very different thing from declaring that mercury can originate a disease of the bone, much less a thickening or hypertrophy, a result which is the very opposite to that which would be expected from this mineral. As many surgeons in the public service have treated syphilis without mercury, they could speak authoritatively upon this

matter; thus Dr. Beith and Dr. Hardie, and some others, stated that they had frequently witnessed tertiary affections and disease of the bone where no mercury had been given.

Now one word on "syphilisation," as being a subject bearing on the nature of the disease. You know that Prof. Boeck, of Christiania, states that for many years past he has been in the habit of inoculating persons suffering from constitutional syphilis with the venereal matter, and that after so many weeks of the practice the matter ceases to "take," and the patient is well. During the process the whole of the syphilitic symptoms disappear. He also states that the cure is much retarded if the patient has taken mercury. I have read his work, in which he details a large number of cases in the most systematic manner, and I cannot but believe in their truthfulness. The Professor does not theorise much on his system, but he seems to think that the poison is thoroughly eliminated by the means adopted. I apprehend his opinion to be that, a virus having entered the system, it must produce its regular "fermentative" changes before the patient can be pronounced free of it, and therefore that every remedy which shall only temporarily retard its operations is valueless, and that a method is to be adopted which shall soonest eradicate it from the system. If this be Dr. Boeck's opinion, it would be analogous to a case of small-pox which should suddenly stop in the middle of its course, either spontaneously or from the action of medicine; under these circumstances our efforts would be directed, not to stay the disease, but to assist in its completion. When, therefore, in the case of syphilis, mercury is given, although it may arrest the disease for a time, it does not cure it; and thus, if the latter is still obstinate, and not disposed to finish off by itself, the method would be to continue inoculating the person with fresh matter until all the stages were complete. This, Dr. Boeck says, he does for three or four months, and the patient is well. If his statement be correct about the retarding influence of mercury, it is a further corroboration of the effects of this drug over the disease.

A principal objection to such theory by some is, that the Professor does not inoculate with the syphilitic virus at all. As I told you, it is the most difficult process to obtain any secretion from an indurated chancre which will inoculate. If you refer to the work of Langston Parker you will there see quoted the various trials of inoculation by different experimenters, and their almost complete failure. Mr. Lee, our home authority, says syphilitic inoculation does not produce a pustule; the disease which infects a patient's constitution begins as an abrasion, pimple, or tubercle. A true chancre does not produce pus, or at least not until irritated. When, therefore, I tell you that Boeck inoculated with purulent matter, it is denied that he used the syphilitic virus at all; his matter, indeed, was obtained from other pustules, from soft sores, from chancres which had been irritated by ointments, and, in some of the cases related by Bidenkap, from matter which ran from the prepuce in cases of phimosis, the character of the sore being unknown. The answer to this by Boeck is simple enough: that he believes the purulent matter under these circumstances does contain the syphilitic virus; in fact, he believes that the local or soft sore contains the same poison. Those, however, who object to this, and who still believe the Professor's statements as to the cures, explain his facts by supposing that the pustules produced on the skin act by an eliminative process, and so assist in getting rid of the peccant matters from the system; and in corroboration of these views it is stated that other irritants have produced like cures—as, for example, tartar emetic. Dr. Boeck himself has used these methods, and admits that a cure of the secondary symptoms took place.

Another element of difficulty, however, is here introduced; for if the irritant used be not of a specific nature, as asserted, tending to render the body insusceptible of the virus for the future, and yet after a time fails to produce the usual effects on the skin, it is evident that some other cause for the result must be in operation. It has therefore been stated that the skin becomes proof against a particular kind of irritation if that be long continued. This explanation, however, throws no light upon the fact of the symp-

toms disappearing and the patient being cured, which is, after all, the fact of practical import. It is not for this reason, however, that I have broached the subject, but rather because the facts elicited do seem to corroborate the idea of the pustular eruption being a final and eliminative mode of getting rid of the disease.—*Lancet, Jan.* 26 *and Feb.* 9, 1867, *pp.* 105, 167.

76.—ON SYPHILISATION.

By Henry Lee, Esq.

[In a preceding number of the Medical Times and Gazette to that from which the following is taken a short account is given of a very interesting experiment.]

A patient, who was supposed to be "thoroughly syphilised," was inoculated with some matter from a spreading sore. The consequence was that each of the inoculated points took on a similar action to that of the sore from which the inoculated matter was taken.

We have here direct experimental proof of a fact which has long been maintained by myself and others—namely, that immunity to one kind of syphilitic matter does not necessarily protect a patient's system against the effects of matter of a different nature. All who have had much experience upon this subject must now know that the ordinary secretion of an indurated sore will, when inoculated, often produce no result, while the secretion from a suppurating sore will produce upon the same patient the specific pustule. But the converse of this—namely, that a patient may become proof against any further inoculation from a suppurating sore and yet be liable to infection from other kinds of syphilitic matter—is a fact which has certainly not hitherto received in England that attention which its importance demands. Practically, some approximation to an illustration of this subject may be afforded. A patient may have a series of soft suppurating sores without any constitutional effects being produced. He may then have an indurated sore followed by the ordinary train of secondary symptoms. This I have frequently witnessed. The suppurating sores do not prevent or modify the indurated sore; and the indurated sore, on the other hand, does not prevent the repeated inoculation of the secretion of the suppurating sores.

In the experiment above referred to, as nothing is said to the contrary, we may infer that the immunity was produced by the usual mode of inoculation lately practised in England—namely, by a very slight abrasion of the cuticle with the point of a lancet. This kind of immunity, as lately shown, does not imply immunity as far as the deeper structures of the skin are concerned, nor does it imply immunity for other parts of the body, and still less does it imply immunity against the action of other kinds of secretion.

As far as our evidence at present goes, a patient might therefore be "thoroughly syphilised," as far as it could be done, by the secretion from ordinary suppurating sores on the surface of the skin, and yet be as liable as any one else to be subsequently infected with the constitutional form of syphilis.—*Med. Times and Gazette, Feb.* 9, 1867, *p.* 152.

77.—GONORRHŒA IN THE MALE.—TREATMENT AT THE HOSPITALS OF LONDON.

Mr. Bryant, of *Guy's Hospital*, tells us that he finds no treatment so successful as the alkaline. He gives the tartrate of potash in scruple or half-drachm doses three or four times a day; and in cases that have passed through the acute stage, in which want of power exists, he combines the alkali with the potassio-tartrate of iron. In many cases of chronic gonorrhœa the tincture of the muriate of iron as a medicine acts very beneficially.

The treatment of clap by injections Mr. Bryant has found very unsatisfac-

tory. He finds that it is uncertain in its action, and at times prejudicial, the carelessness of hospital patients more than anything else rendering the practice inefficacious. Some years since he gave an extensive trial to frequent injections of some slight astringents, such as alum, in the proportions of two grains to the ounce; and when the patient injected the solution every hour a rapid cure was not unfrequently effected. A solution of tannin of the same strength was also found useful. The practice could not be followed up in the majority of cases on account of the inability of the patients to find the time for it. Mr. Bryant is now employing a concentrated solution of tannin in glycerine introduced into the urethra on a bougie at short intervals; and, up to the present, his experience speaks favourably for the practice.

At the *London Hospital*, where the patients are low in the social grade, and careless of their own health as well as devoid of all domestic comfort and convenience, Mr. Maunder usually treats a case of uncomplicated gonorrhœa so as to give as little trouble as possible to the patient himself. At both the onset and subsidence of the attack a mixture, composed of copabia, liquor potassæ, spirit of nitric ether, and camphor mixture, to be taken thrice daily, is prescribed; and a low diet, with abstinence from malt and spirituous liquor, is ordered. Tea, milk, water, and the like may be taken to any extent. Should the case run on to the acute inflammatory stage, a scruple of acetate of potash, with or without the eighth of a grain of tartar emetic and of morphia, for a dose, is substituted, and is ordered to be taken every four hours, night and day if possible. Patients generally manage to take either four or five doses during each twenty-four hours. An occasional purge. No stimulants of any kind, but as much in the shape of diluents as the patient can be induced to swallow. The potash tends to diminish the naturally irritating quality (acidity) of the urine when passed over an inflamed surface by neutralising the acid; and bland fluids, by distributing the acidity through a large quantity of the renal secretion, have a similar tendency. Should the case degenerate into a gleet, and scalding on micturition have disappeared, twenty drops of the tincture of steel, thrice daily, is the remedy employed. In private practice Mr. Maunder prefers to treat a recent attack of gonorrhœa by oft-repeated injections of sulphate of zinc, not omitting also to apply *general principles* suitable to an inflammatory disease.

In Mr. Callender's practice at *St. Bartholomew's Hospital*, cases of acute gonorrhœa in the male are treated with injections of sulphate of zinc (two grains to one ounce of water); if there be much local inflammation the use of the injection is suspended for a time, and the inflammation is allayed by means of warm fomentations, warm baths, and the internal administration of opium in some form or another, or by the use of a suppository of morphia introduced into the rectum. During the treatment the general health is considered according to the requirements of individual cases, and under all circumstances medicine is given to maintain free action of the bowels. Diluents are prescribed, and the urine rendered as little irritating as possible. The ordinary diet, if moderate, is not interfered with. The patients are, as a rule, very dirty, and this is a difficulty not easily got over; but they are ordered to keep themselves clean, and to bathe away discharge, from suppurating bubo or from urethra, ten or twelve times daily. The end of the penis, if covered at all, is only loosely so, that discharge may find easy outlet and not accumulate. It is almost invariably necessary to deal with phimosis, when present, by operation, and this for the sake of cleanliness.

This, in brief, is the general plan, and one all but invariably successful. Inflammation of the testicle is set right by support (chiefly supplied by the local application of a large linseed poultice, which serves also as a kind of fomentation), by opium, and by the recommendation to remain in the recumbent position for a few days. If patients are sent to the out-patients' room with so-called gleet, the cause of the discharge is of course first investigated. If it be simply the remains of a gonorrhœa it is seldom interfered with, as it will get well of itself sooner than if harassed with reputed remedies. Of, such, however, the local application of bougies, or the counterirritant effects

of blisters applied to, or of nitrate of silver rubbed over, the front of the upper part of the thigh (Scarpa's triangle) are found the most efficient. Enlargements of the glands in the groin are treated with lead lotion and rest (if attainable). If the parts around them inflame they are poulticed, and, if it be absolutely necessary, they are opened by free incision (the line of cut being, without exception, vertical), and are not allowed to break of themselves.

At *King's College Hospital*, for gonorrhœa in the male, the plan of treatment found most generally successful by Mr. Wood is—

In the acute stage.—1. To commence the treatment by prescribing abstinence from wine, beer, and spirits of all kinds, and from stimulating food. 2. Then to administer a saline aperient, or a drachm of compound jalap powder, or a drachm of jalap and calomel (if the patient be of bilious habit), at intervals of three or four days or a week during the treatment. 3. Then the administration of liquor potassæ, or bicarbonate of potash with camphor mixture, or the infusion of pareira three times a day, with the abundant use of diluent drinks, such as toast-water, cold tea, barley-water, or linseed tea. 4. In a day or two after the commencement of the discharge, the *frequent* injection of a weak lotion made with glycerine, two ounces to each half-pint. This is continued throughout the acute stage. In no instance has it been considered to be the cause of swelled testicle. 5. In swelling of the testicle, the recumbent posture or mechanical support, with hot fomentation and calomel and opium to relieve pain. In cases attended by severe pain, or where prompt relief is urgent, a small puncture into the distended tunica vaginalis and epididymis is at once followed by a dimunition or entire cessation of pain. A little blood-and-serum usually issues from the puncture. In no case has this practice been followed by a bad result. Mr. Wood does not puncture the testicle itself, considering that the chief seat of the swelling in these cases is the epididymis and tunica vaginalis. In one case where the gland had been punctured by a surgeon he observed an adhesion formed between it and the skin, giving some annoyance and inconvenience to the patient. 6. To allay chordee, camphor-and-henbane pills are used, or, in severe cases, morphia or chlorodyne, aided by the local application of iced water, lead lotion, or evaporating lotion.

In the chronic stage.—1. While the discharge remains thick and profuse, he uses the copaiba emulsion with dilute sulphuric acid or copaiba capsules, and frequent injections of sulphate of zinc, alum, or nitrate-of-silver lotion; recommending particularly the complete washing away of the discharge by a syringeful of water, so that the injection may be applied directly to the inflamed part. 2. As a change of remedy in obstinate cases, powder cubebs in drachm doses. 3. In sluggish cases with gleety discharge and general debility, he uses tonics and mineral acids, and especially the tincture of sesquichloride of iron, twenty minims three times a day, with water: and if the discharge becomes gleety or thin, he has found great benefit from the injection of a weak solution of chloride of zinc, and also from the perchloride of iron, mixed with glycerine and water in each case. The two latter are his chief resource in cases of gleet not depending on stricture, varied by the application of the same substances by the use of the bougie of cocoa-butter, or with matico.

At *St. Mary's Hospital*, Mr. Gascoyen has found that, in the very early stage of gonorrhœa, before the urethra is much inflamed, and the discharge and scalding are still slight, weak astringent injections, frequently repeated, will generally subdue the disease in a few days. When, however, the inflammation has become severe, with profuse discharge, ardor urinæ, chordee, &c., he does not use injections, but considers copaiba to be the most valuable remedy. This drug he administers in the form of capsules, beginning with small doses, and gradually increasing them until a maximum quantity of from forty to sixty drops of the balsam is taken during the day; this large dose is persisted in for two or three days, and then rapidly decreased. If the curative action of the drug be not experienced within ten or twelve days, it will fail to effect a cure. Mr. Gascoyen has frequently seen the disease yield to

this treatment, and it gives almost immediate relief from ardor urinæ and irritability of the neck of the bladder; should these symptoms be very distressing and the chordee severe, the medicine may be most usefully supplemented by suppositories of soap-and-opium.

The effect of the copaiba upon the digestive organs should be carefully watched, and if nausea or purging be occasioned the quantity must be at once diminished. The eruption which sometimes is produced by the use of this medicine is, in Mr. Gascoyen's experience, very rare; he considers it to depend upon an idiosyncrasy on the part of the patient, or to his state of health, as it is generally caused by a few small doses of the drug.

After the violence of the attack has subsided, or when the treatment by copaiba is insufficient, weak injections may again be employed, with drachm doses of cubebs if the discharge be very obstinate, and then quinine; tincture of iron and other tonics will often prove of service. Meat and an unstimulating nutritious diet should be given throughout, and the general health maintained, lest the discharge become chronic, when it is often most persistent and difficult to cure. In many cases wine may be allowed from the commencement, and where the discharge shows a tendency to become chronic it will often be found of great service, and especially in persons of a scrofulous habit. Each individual case, however, requires its treatment modified according to the condition of the patient.

The treatment by salines and depletory remedies in the early stage of gonorrhœa Mr. Gascoyen has found not only useless in controlling the inflammation, but positively injurious, by allowing time for the disease to run its course unchecked before the employment of more efficient means. The so-called "abortive" treatment—that of injecting strong solutions of nitrate of silver into the urethra to destroy or cut short the disease at its onset—he has scarcely ever known to succeed; but has seen attacks of gonorrhœa much aggravated by it, and in a few instances dangerous symptoms followed its use.

Mr. Barwell, of *Charing-Cross Hospital*, has for years past treated gonorrhœa as a simple non-specific disease avoiding copaiba, which by disordering the stomach and causing loss of appetite, depresses the health, and is apt to increase or lengthen the disease. In case of a first attack, in which inflammation runs high, a purge, hot bathing, and an alkaline medicine, either diuretic or aperient as may be indicated, followed by an injection of sulphate of zinc — two grains to the ounce. Second or subsequent attacks may be treated without such preparation by injection, free action of the bowels being secured, if necessary, by medicine. If the patient apply on the first day of the discharge showing itself, a week may often suffice to check it. More chronic cases may be advantageously treated with tannic acid—three or four grains to the ounce; and, in order that the fluid may remain longer in contact with the mucous membrane, it may be thickened with starch or sugar. Mr. Barwell has not found that orchitis follows the use of injections of the above strength more frequently than it succeeds to gonorrhœa not locally treated; and stricture is certainly a rarer sequela to such treatment than to a clap allowed to run on for weeks or months. The slight but continuous discharge of a gonorrhœa become chronic is often difficult of cure. Turpentine, either Chian turpentine or Canada balsam, with black or Cayenne pepper, is frequently useful. Tincture of steel and tincture of capsicum often avails. As a pepper, cubebs will have a similar effect; but it is not better, and is more clumsy, than the above-named sorts. The most certain and efficacious treatment is by an ointment containing from three to five, and even to ten, grains of nitrate of silver to the ounce of lard. A small bougie smeared thickly with the ointment is passed from half an inch to an inch and a half down the urethra, and left there for half a minute or more; and this should be repeated at least every other day. In general, commencing with the mildest ointment, one need not increase the strength beyond five grains to the ounce. In only one very obstinate case was it used ten grains to the ounce; but the patient got well without a bad symptom.

At *University College Hospital*, Mr. Christopher Heath, looking upon the

disease as purely local—at least in its earlier stages,—uses injections from the first, but modified according to the circumstances of the disease and of the patient. If the patient is seen in the premonitory or very early inflammatory stage, Mr. Heath believes that the disease may be cut short much more effectually and safely by a strong lead lotion (liq. plumbi diac., ℥j., aquæ, ℥ vij.) than by solutions of nitrate of silver. In the ordinary acute form of the disease, injections of warm water and weak lead lotion, together with bicarbonate of potash and henbane internally, are found to relieve the symptoms, and are followed up by a sulphate of zinc injection when the acute symptoms have subsided. Although beer is interdicted, the patients are permitted a glass of weak gin and water at night, and their diet is not interfered with. Copaiba is rarely given, and only in the cases where the discharge continues profuse, though thin, some time after the inflammatory symptoms have subsided.

Complications.—Chordee Mr. Heath finds to be effectually relieved by the application of extract of belladonna and glycerine along the under surface of the organ, combined occasionally with a sedative pill (opium or henbane) at night. Orchitis in the acute stage is found to yield readily to antimony in combination with sulphate of magnesia; and where there is much œdema, a puncture is made into the tunica vaginalis, where, under these circumstances, there is a certain amount of effusion. In the later stages, strapping, or the use of mercurial ointment is found to remove any remaining enlargement.

In cases of gleet, Mr. Heath makes a careful examination of the urethra both with bougies and with the endoscope, in order to discern the exact nature and situation of the disease. If, as frequently happens, a distinctly diseased surface is discovered, a strong solution of nitrate of silver is applied topically with the best results; if the disease appears to be more general, the use of astringent injections, the passage of a large metal bougie, and the internal administration of steel yield satisfactory results. Mr. Heath believes that in many chronic cases the so-called gleety discharge is nothing more than the ordinary secretion of the mucous follicles of the urethra, increased by the over assiduous manipulations of the patient, and that this subsides as soon as the attention is diverted from it.

At the *Middlesex Hospital*, Mr. Hulke has for several years treated gonorrhœa almost exclusively by injections, being influenced in this practice by the obvious analogy between purulent inflammation of the mucous membrane of the urethra, and that of the conjunctiva. In the early stage, when the inflammation is acute, he prefers an injection of acetate of lead, frequently repeated, gives a free purge—commonly compound jalap powder—and forbids beer and spirits. In the more chronic condition, he often uses an injection of one grain of nitrate of silver to eight ounces of water, the general rule being to use week injections rather frequently, but stronger ones at longer intervals. In old gleets he prescribes occasionally copaiba or cubebs, but more frequently the tincture of sesquichloride of iron.

Buboes, when seen before suppuration has commenced, are leeched, but when suppuration impends, are painted over a small spot with a strong solution of iodine, which either effects their resolution or more often hastens their pointing. They are always opened by a vertical cut. Sinuses and induration are treated by a compress and spica bandage. Mr. Hulke does not find that the treatment by injection tends to promote secondary orchitis, nor does he think the objection that it is more often followed by stricture well-founded. The liability to stricture is proportioned to the duration of the disease; and this is shorter under the treatment by injections than when internal remedies only are used.

Consecutive orchitis, at first, when the symptoms are acute, is commonly treated by a few nauseating doses of tartar emetic with Epsom salts; and generally on the second or third day the testis can be strapped. This should be done with the patient recumbent, and before the strapping is applied he should gently compress the testis with his hands, in order to empty it and the scrotum as much as may be of blood. This plan is

very preferable to the erect posture, in which dressers commonly strap the testicle.—*Lancet, March* 16 *and* 23, *and April* 13, 1867, *pp.* 331, 362, 458.

78.—ON THE TREATMENT OF GONORRHŒA.

By Spencer Watson, Esq., Montague-street, Russell-square.

[The following article was elicited by the account given of the treatment of gonorrhœa in the London Hospitals. Mr. Watson calls it the "Disinfectant Treatment."]

This plan consists in frequent injections of a solution of carbolic acid and bicarbonate of potash, half a fluid drachm of the former and one drachm of the latter to a pint of water. I direct this injection to be used every two hours if the gonorrhœa has only just commenced, and there is little or no thick pus being discharged, and if there be little or no swelling of the glans penis. If there be any great swelling of the glans, and copious purulent discharge and much scalding, I discontinue the injections, and use antiphlogistic medicines internally. The liquor of acetate of ammonia and tincture of henbane are very useful in this stage. When the swelling has abated, I recommence the injections of carbolic acid and potash every 3 or 4 hours.

I have every reason to be satisfied with the results of this plan of treatment, which I have tried at King's College Hospital during the last seven or eight months. I at first used carbolic acid alone without the potash, and in one of two cases unpleasant symptoms occurred, which seemed to be due to the great irritation set up by the acid. I have not found any such results from the injection of carbolic acid and potash.

I have been in the habit of treating the acute orchitis in gonorrhœa by puncture of the tunica albuginea in all cases in which there was severe pain, such as prevented sleep. It has almost always given speedy relief, and in several instances in which other remedies had been tried, and had failed to relieve the pain, the incision into the front and lower part of the testicle, as recommended first by Vidal de Cassis, and more recently by Mr. Henry Smith, has given speedy and persistent relief of all the symptoms.

I have had no experience of puncture of the epididymus, as mentioned by Mr. Wood; but I can confirm his statements of the *immediate* relief afforded by merely puncturing the tunica vaginalis. In two cases I let off the serum that had collected in this cavity by means of a fine trocar, and the patients expressed themselves as much benefited; but they soon had a return of the pain and swelling. I am inclined to think, therefore, that it is of importance to let blood from the organ as well as to slacken the distended serous bag.

[In another communication to the Lancet, a correspondent, M. D., proposes that "the following treatment should be fairly tried."]

For males: pills and injection only; of calomel and compound colocynth, one to two and a half grains in each pill, night and morning; one drachm of tincture of iodine to six ounces of water for injection every three hours with a small glass syringe.

For females: pills and iodine paint only; of blue pill and compound rhubarb, one to two and a half grains in each pill, night and morning; tincture of iodine applied with the speculum and camel-hair pencil internally every day.

I have used this treatment during ten years without a failure—in all sorts of cases, however inflamed the parts may be in gonorrhœa, or obstinate the gleet.—*Lancet, March* 30, 1867, *p.* 411.

MIDWIFERY,

AND THE DISEASES OF WOMEN, ETC.

79.—ON THE COMPARATIVE VALUE OF THE LONG FORCEPS AND TURNING IN CASES OF CONTRACTED PELVIC BRIM.

By Dr. Alexander Milne.

There is no little diversity of opinion yet existing among obstetric practitioners with regard to the best line of procedure in those cases of disproportion, where the head, despite of good pains, becomes arrested about the pelvic brim. I allude more particularly to those cases of moderate contraction where the conjugate diameter ranges from two and three-fourths to three and a-fourth inches, excluding those more serious instances of diminution and distortion where craniotomy is inevitable. I say inevitable; for I am afraid we shall not be able to abolish this operation entirely, though limiting it as much as possible, any more than we have been able by means of ergot to bid adieu to the forceps, as was at one time fondly fancied, or to cure all maladies by the knowledge of the circulation and properties of the blood, as the illustrious Harvey—who was also, by the way, a respectable midwife,—ardently dreamed.

A conjugate brim diameter of the above size, the head being of the ordinary dimensions, almost always demands the interposition of art, and the question is, what shape or form shall the interference take, in order best to fulfil the object ever before our minds, viz., the accomplishment of delivery in the way most conservative of maternal and fœtal life, least fraught with injury or sacrifice? An important question, too, this undoubtedly is, for in such cases two lives are somewhat in danger—a danger that may, and does at times, eventuate in death. Only two alternatives are presented to us, excluding craniotomy on the one hand, and on the other the induction of premature labour, which, however implies a previous knowledge of particular pelves, an operation of paramount value where more serious diminution exists. These alternatives are the long forceps and turning.

I. *Forceps.*—I shall take the forceps first. Now, of course, I have got to deal with the long forceps only, or with what has been forcibly and significantly termed by Dr. M'Clintock, the "high operation." The short forceps I will praise as loudly as any one; believing it to be a comparitively safe instrument, and that countless lives, both of mothers and children, have been rescued by it since the days of Paul Chamberlen. But can the same praise be awarded to the long instrument? Does the same value attach to it? Can it boast of as many achievements, unmixed with disaster? I fear not. What are its claims? The chief merit claimed for the high forceps operation is, that by it we may occasionally extract a child in cases of narrowed brim, where no other prospect is offered but the "sad and horrible" one of craniotomy! Now, granting that this happy result is obtained in some instances, and conceding further for argument's sake, that turning in these same cases could not have been accomplished, the question remains, Is the result worthy the price, or is the benefit obtained not outweighed by the

attendant risks and dangers? Take the mother first, as the more important life, according to obstetric ethics—the life to be protected and spared in preference to the child's, according to the views alike of existing luminaries, and of the "great ones gone." What dangers threaten her, to what hazards is she exposed? In the first place from the long delay, and delay is inseparable from such cases (the os being long in dilating), she may become exhausted, and suffer from a train of well-known painful symptoms; or the protracted pressure may lead to inflammation, suppuration, and sloughing, fruitful of those unfortunate maladies that afford scope for the ingenuity of the Sims and the Wells, the Browns and the Bozemans; or even rupture of the uterus, with its usually fatal termination, may be induced. Some, nay many, may escape with impunity; but it is undeniable that, in general, delay is pregnant with danger or, as Sir James Simpson pointed out long ago from the tables of Collins, "the longer any patient remains under labour, the less chance has she of recovering from her confinement." Such are the risks prior to the use of the instrument; in its application mischief threatens her probably even more. For example, the vagina, tumefied by the delay, may be readily torn, or some part of the uterus may be lacerated. Indeed, no one can tell what injury the point of the blade may do as it travels its critical way within the cavity of the womb any more than we can tell what lies at the bottom of a draw-well, or in a valley in the moon. Further, even when the instruments are applied and locked, there is the force required for extraction: often very great as I have seen,—so great that it were almost a miracle to escape contusion and laceration of parts. And here I would just interpolate that I was very much struck when, at our last meeting, one of the respected Fellows of this Society declared that he was in the habit of keeping the forceps on for no less a period than two hours. Such a practice is, I should think, far from safe; nay, it is big with risk, as the records of midwifery show. I witnessed one case where everything seemed to be going fair; the blades were fairly applied, though not without some difficulty, and the child was extracted, though not without a good deal of that article which sage writers justly declare should have no place in midwifery,—I mean force; but on the completion of delivery unequivocal symptoms of rupture were manifested, and the case terminated fatally. Many similar cases are on record, as, for example, cases 11 and 12 in the Clinical Midwifery of Dr. Robert Lee.

Take now the case of the child. How fares it in general? Is it free from hazard in the "high operation"? Certainly not. In the first place, that very pressure to which I have referred as injurious to the mother, the pressure exerted by the uterine contractions ere the os is sufficiently dilated to admit of art stepping in, may destroy its life. Its brain will not tolerate the prolonged compression with impunity, even while within the womb. Of this the stethoscope can inform us. Then, if it should escape this Scylla, there is the Charybdis of the forceps. The compression to which the head is exposed during the "high operation" is doubtless severe; and if, as is generally the case, the blades are applied obliquely, then the force is exerted in the antero-posterior axis of the head, which is believed to be the most dangerous direction. Lastly, if it escape with life, it is perhaps not very far-fetched to say that that life may be a sad one, for it is suspected that permanent brain injury—mental damage—may result from the severe compression of the head; and if such be the case, we may thus entail on a family a source of perpetual sorrow and compassion, and on the state a helpless and hapless member, incapable alike of protecting himself or others. Peril to the mother, and risk to the child, then, always attend these long forceps cases; but even greater misfortune is not uncommon, for the operation may be altogether impracticable. Failure may attend the most dexterous efforts to introduce the blades. The non-success may arise from some part of the os being undilated, either from rigidity or pinching between the head and the pelvis, or from a jutting forward of the sacral promontory, or the want of sufficient space, or, as in one singular case that I witnessed, from a tight circular band of uterine tissue (probably an undeveloped or tetanized portion) in the cervical zone. Or again, one blade may pass, and the other fail,

or both may enter, yet refuse to lock, being placed on divergent instead of parallel lines. This, of course, involves withdrawal and re-introduction, with delay and renewed risks, and possible failure a second time. Moreover, the instrument may be applied, and yet our efforts to bring down the head prove fruitless and unavailing. The object in these cases of contracted conjugate is to diminish the transverse diameter; but it so happens that the antero-posterior direction of the brim is the one that presents greatest difficulty; and therefore in applying the blades in the transverse or oblique diameters of the pelvis, which are the most accessible and feasible, we augment the transverse diameter of the fœtal head, the very one we require to lessen, and thereby aggravate the task of extraction. I am aware that the increase may be partly in the direction from the vertex to the chin, but it must also be to a certain extent from one parietal bone to the other, and even a small amount may prove an insuperable bar to delivery in such cases. I have now seen two or three where considerable force—probably a good way beyond legitimate or safe limits—failed to procure any palpable descent, and where the instrument had to be withdrawn and abandoned.

II. *Turning.*—This operation, known to the ancients and practised by the older authors, was especially much in vogue after its advantages had been demonstrated by Paré and his pupils; but in this country at least, the introduction of the forceps eclipsed it somewhat, and it fell into comparative disuse for a lengthened period. In France, happily, in my humble estimation, turning did not receive so rude a shock, but stood its firm ground, and was had recourse to by many, as before.

What claims has version to our confidence and support? In the first place, there is a mechanical advantage obtained by it, as pointed out by Baudelocque and Sir James Simpson. This arises from the fact that the diameter of the base of the fœtal head is less than that of the interparietal, and because the transverse diameter, which is the most important in most cases of narrow brim, may be reduced to a greater extent when the base is made to enter the pelvis first. There may be something also in this, that whereas in the case of the forceps, as we have seen, one diameter alone is reduced (which reduction involves increase in another direction); in traction, all diameters are compressed and lessened more or less, and the fœtal head becomes moulded into the particular shape of the pelvic brim. These views are doubted by some and denied by others, but surely a succession of cases where turning succeeded, after the forceps failed, ought to cut away any ground for scepticism or dissent, and win acquiescence and approval. If it be the case that we have a virtual increase of space—that the head will pass a more limited space in this way—the advantage can hardly be overestimated, the gain is unspeakable, for we may thus, in many cases, avoid the woeful work of perforation, and bring home even a living child.

Another advantage pertaining to turning is that it may be performed at an earlier period of the labour. In the case of the forceps, it is alike impracticable and unsafe to apply them unless the os be almost entirely dilated (and the expansion and disappearance of its disc may take a long time indeed); in turning, on the contrary, the hand may be often gradually and safely inserted when the os is only the size of a half-crown. There is here a twofold benefit. On the one hand, and on the side of the mother, we avert the chance of exhaustion and the grave results that spring from prolonged pressure; and, on the other, we avoid the protracted compression of the fœtal head, which may prove fatal, time being equivalent to force. The full benefit of this early action and interference is best obtained, and its value and beauty seen, in those cases where we have become acquainted with narrowed pelves, and are early on the ground watching for the earliest fit and practicable moment. In such instances, if we are present before the escape of the waters especially, and if we employ chloroform, delivery may be effected in a very few minutes, and while the patient is in a pleasant trance. How marked again the contrast between this process and that of the forceps, with its long, and anxious, and painful delay, and probable chain of formidable ills!

A third recommendation may be noticed briefly, and that is, that the per-

formance of version demands no other instrument than the soft hand. The essence of the merit here lies not so much in the fact that it can be done in the absence of obstetric instruments, for these ought always to be forthcoming, if absolutely indispensable, but because the avoidance of hard steel is tantamount to the avoidance of probable damage and possible disaster.

Such are the principal advantages of turning in cases of disproportion at the brim; but I must now glance at the other side of the picture, for there are certain demerits, disadvantages, and disabilities with which the operation stands chargeable. As in the case of the forceps, I begin with the mother. What are the alleged risks and dangers incident to her? It is said that her soft structures, the vagina and the uterus, may be bruised or torn by the hand of the operator, and that laceration may also be occasioned by the movements of the fœtus as it revolves round its own axis in the process of turning. Now, surely, the soft hand, endowed with sensation, feeling its way as it cautiously enters the uterus, is far less likely to injure than the hard and sensationless iron. The hand can detect obstacles and recoil, again to surmount them, while the unperceiving metal, even cautiously inserted, may force its destructive way through them. Then, in the gradual revolution of the fœtal body, there cannot surely be much danger, seeing that with care nothing but smooth and convex surfaces need be presented to the uterine wall. Of course, when the head is been dragged through the brim, the uterus is liable to be crushed at any prominent pelvic points; but the hazard here cannot be so great as in the case of the forceps, where the iron lies along the fœtal cranium. This is not mere conjecture, for experience goes to show that the operation is not by any means a dangerous one for the mother; and in proof let me again quote from Ramsbotham. In a foot-note, he observes, "Between the years 1823 and 1852, I delivered nearly two hundred women under transverse presentations. Many of these cases presented a formidable appearance; for in one the membranes had been ruptured a whole week; in another sixty-nine hours; in a third forty-eight," and so on. "In not one of these instances," continues he, "was an injury inflicted on the uterine structure by the hand, so far as I know; nor did any permanent evil arise that could be attributed to the operation." Such is the testimony of an able and experienced accoucher and author; and could stronger proof be adduced of the safety of turning, so far as the mother is concerned? I think not. I may also add, that in not one of the cases in which I have operated, and these amount to twenty-seven in all, including a few transverse presentations, &c., were there any evil consequences to the mother.

But it is alleged further, that after bringing down the feet we may fail to make the head pass the brim, and thus have to perforate in a more unfavourable position. Now, I think that if a careful gauging of the brim be made beforehand by that natural pelvimeter, the hand, preferable in my opinion to the instruments of Baudelocque and Coutouli; if the sacro-pubic diameter be thus previously measured, the chance of failure is less likely to occur; and even were it unsuccessful, I am not so sure that craniotomy would be much more difficult. Having, however, never failed myself, after getting hold of the feet; I can give no opinion founded on personal experience.

Lastly, it is said that another dilemma may be in store for us; we may in some cases fail to reach the feet. The head may be filling the brim too closely for the hand to pass, or the uterus may be contracting so vigorously as to defy the most skilful and persistent attempts. Now, cases of this kind do occur, but not very often. In the two hundred cases before alluded to, Dr. Ramsbotham only failed fourteen times, and these were instances of extreme difficulty. It is wonderful how easily the head may be pushed out of the way, and the hand glide up to the fundus of the womb, unless in those cases where the organ has taken on permanent contraction, and is therefore considerably diminished in size. Besides, incalculable benefit is to be got from chloroform in the way of overcoming the force of the uterine contractions, and inducing relaxation of parts; and I am not so certain whether Dr. Ramsbotham might not have lessened even his few failures had he been a

greater believer in the wondrous anæsthetic; although no doubt the greater bulk of these cases occurred before the introduction of chloroform.

I come now to the child. What are its prospects in turning in these cases? Those who oppose version found much of their hostility on the dangers to the infant. They say that it is jeopardized in two ways,—two swords as it were hang by a slender thread over its head; if it escaped the one, it is almost certain to perish by the other. There is, first, the risk of pressure on the funis; and, secondly, that arising from over-extension of the neck. Now, it would be absurd to deny that these are serious dangers, but yet it is wonderful how often they are, or may be escaped. For instance, with reference to the cord, there is the chance of its getting a safe lodgment in some niche of the pelvis, and the probability of fatal compression will be diminished by effecting the passage of the head as speedily as possible. I need hardly add, that the most persevering efforts should be made if the child when born should not breathe; in one-case of suspended animation, I was rewarded with success after twenty-five minutes' exertion.

Then, with reference to the extension of the neck, I have only to say (while admitting freely that mischief may occasionally be inflicted in this way) that it is truly surprising what an amount of trailing, or traction rather, these "little clouds of glory" will bear. The strength of their neck is quite wonderful; and probably, as the head will bear more compression with impunity while the child is in utero, so the neck will tolerate greater extension. At all events, I have pulled pretty strongly for a minute or two, without entailing even ephemeral injury, as evidenced by the liveliness and contentment of the child when it was ushered into the world. Moreover, it should be borne in mind, that, owing to the head when it enters with the base first, adapting itself more correctly to the brim, the points of resistance are diminished, and less force is required to pull it through. I have seen more than one case where the head paused about the brim for hours, despite vigorous pains, and yet when the feet were caught, no more force was required to bring it through than was needed for the other parts of the body.

Such then, are, I think, the principal points connected with turning. It is in my opinion a valuable operation in cases of moderately contracted brim, and my own experience of it leads me to commend it strongly. It is by no means dangerous to the mother as a rule,—I think much less so than the high forceps operation; and it is yet an unsettled point whether it is fraught with more peril to the child. I mean, of course, in the aggregate of cases, for I am contrasting it with the long forceps, with its delay and severe compression, and the results of these and probable failure with craniotomy looming ugly and sombre. But even admitting for argument's sake that the hazard to the child is greater in turning, if it be conceded that the danger to the mother is less, then we are shut up to version as the proper and preferable course, if we subscribe to the obstetric doctrine that the mother's life is the most valuable. Turning, then, should be the rule, and not the exception; and instead of waiting long and weary, and, for the patient, critical hours, until the head makes its dubious descent far enough to render the forceps practicable, hours during which the unfortunate woman may, like the Congress of Vienna, as Talleyrand remarked, dance and tumble long enough without the head advancing any, we should proceed to seek for and bring down the feet, and thus deal most mercifully and conservatively with the dearest life, and probably no less safely with the obstetrically cheaper life of the child. Doubtless more statistics are desiderated to carry conviction with some; these I trust shall be forthcoming. In the meantime I conclude by presenting a few as my instalment to the growing offertory, hoping that they may help in a small way to further the solution of an obstetric question in which is bound up the safety of many mothers and children.—*Edinburgh Medical Journal, March*, 1867, *p.* 798.

80.—ON AN IMPROVED FORM OF HANDLE FOR MIDWIFERY FORCEPS.

By Dr. Andrew Inglis, Accoucheur to Edinburgh New Town Dispensary.

The principle which has suggested to me the alteration I am about to describe in the construction of the handle of midwifery forceps may most simply be illustrated by reference to the form commonly adopted in mechanical contrivances where strong manual traction is required. In these the handle consists of a crossbar at right angles to the line of traction, so that the hand and forearm of the operator may lie directly in the line of traction. A common corkscrew is, perhaps, the most familiar example of this arrangement. If such a handle were to deviate from the direction I have mentioned, the power of traction would be diminished in proportion to such deviation, and the power of directing the traction would also be impaired. Nevertheless, the handle of our ordinary midwifery forceps (with the exceptions I shall refer to) lies directly in the line of traction, and therefore in the most disadvantageous position possible. By this means not only is much force that might be employed in making direct traction spent in mantaining hold of the handles, but the wrist is put into a constrained position, and, the hand and arm being placed at an angle with each other, a farther loss of power is thereby occasioned. In this country Sir J. Y. Simpson and Dr. Radford have long recognised these principles in the construction of their respective forceps. In Dr. Radford's long forceps there are two horns, one on each handle, near the blade, which form a sort of crossbar by which we can pull without requiring to grasp the handles very firmly. The handle, however, beyond these horns is long and smooth, and cannot be used without compressing the head. Sir J. Simpson's forceps have two horns also, but they are better adapted for strong traction, and the rest of the handle, which is shorter than Dr. Radford's, is deeply notched, so as to do away to a great extent with the necessity for compression while pulling. I have for some years used this last-named pattern of forceps, and have observed that in almost all cases compression was unnecessary, traction by means of the horns being sufficient to keep the blades together. In consequence of this I have made some experiments to see how far the compressing power can be dispensed with and how far the power of traction may be improved. The result has been the production of the two pairs of forceps I have figured. The small pair (Fig. 1) was made first, and was intended to be used only in cases of uterine inertia or slight contraction of the outlet; but the success I met with in such cases induced me to use them in a very severe one, where the head was near the brim, and in this case also the result was good. The measurements of this pair are—From A to D, 10 in.; from A to C, 4 in.; fron A to B, 3·5 in.; breadth of handle, 2·5 in.; weight 13 oz.

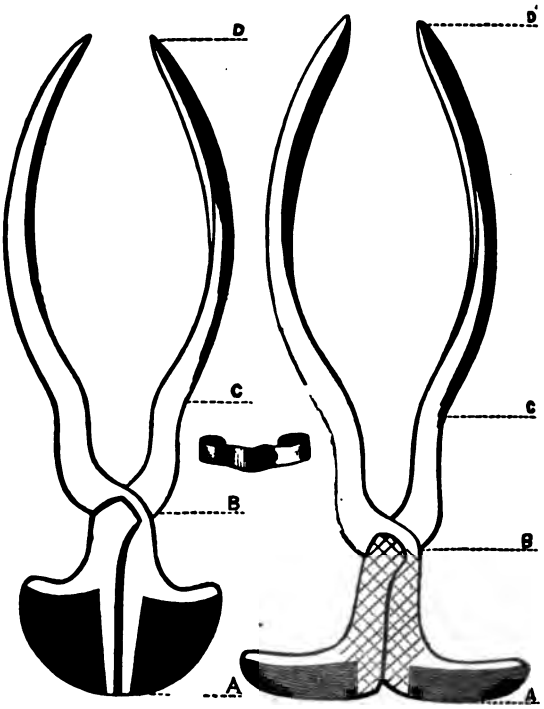
Though quite pleased with the grasp and power of this short pair, I found one disadvantage connected with its shortness. The distance from the tip of the blade to the lock is only 6½ inches, so that great care is required in the high operation lest a small piece of skin be nipped in the lock. To obviate this, I constructed another pair (Fig. 2), in which the distance from tip to lock is about 8 inches. With this pair no such accident can occur. The increase of length in the blades however increased their leverage, and the handles had also to be lengthened proportionately, to prevent any chance of slipping; to effect this, the horns were removed the requisite distance from the lock. The handle then (if made like that of the first pair) was not much shorter than in an ordinary pair. This length, at last, I managed to get rid of by extending the horns laterally so that the cross pieces should fill the hand. The measurements of the long pair are—From A to D, 10·3 in.; from A to C, 4·4 in.; from A to B, 2·2 in.; breadth of handle, 4·5 in.; weight, 14 oz.

I have not required to use this pair yet, but have tested it thoroughly on the model, and find that it affords a secure hold.

As some who have not seen the instruments in use have expressed a fear that with such short handles the blades might lose hold, I have contrived a

link which can, after the forceps are locked, be applied at the point marked C, and which totally prevents any slipping. I may mention, however, that

FIG. 1 FIG. 2



I have not seen any occasion to use it, nor do I believe that it is necessary; as the direct compression exerted by the hand, and the indirect compression produced by the traction on the horns, seem to be sufficient.

The advantages which this plan of shortening the handles of midwifery forceps possesses are, (1) greater portability; (2) greater facility for introduction; (3) improved power of traction; (4) improved power of guiding the traction.

This alteration of shape in the handles can be applied to any form of blade, and the link also may be used with any pattern. Those I have figured have blades very similar to those of Sir J. Simpson's long forceps, having, like them, near the lock a space between the blades into which the forefinger of the left hand may be inserted.—*Lancet, Dec.* 22, 1866, *p.* 692.

81.—ON THE MANAGEMENT OF THE SECOND STAGE OF NATURAL LABOUR.

By Dr. JAMES HARDIE, Manchester.

[The following paper was read before the Medical Society of Manchester. The views which Dr. Hardie has been led to entertain, and the practice which he adopts, are at variance with those of the profession at large.]

The proposition to which I would invite your attention is this: *That in the second stage of a large number of cases of what is termed "Natural*

Labour," we may make use of our art in assisting nature, and thereby shortening the duration of labour, with perfect safety to mother and child : and that, this being the case, we are called upon to make a change in our practice accordingly. I shall take it for granted, without entering into the question that the forceps afforded the best means of accomplishing this end, and the subsequent remarks will be based on this assumption. This will be generally conceded, though I by no means insist upon it. At present I only seek the admission of the first proposition, and will then freely leave it to each individual to use whatever may most commend itself to him, whether it be forceps, vectis, air tractor, or something else.

Though the strictures enjoined by the older writers, such as Denman and Osborne, against interference, are now all but universally considered as obsolete, still there can be no doubt that the effect of their teaching is perceptible in that of the schools at the present day. The principle of non-interference has been so skilfully embalmed in the axiom, "Meddlesome Midwifery is bad," that in our most recent works we find the propriety of it recognised as a thing indisputable, and have the question of the necessity of violating it most carefully discussed. And it is a well-known fact, also, that the whole profession is pervaded by a certain ill-defined feeling of timidity regarding the use of instruments—that they are not proper or not safe—so that, generally speaking, they are religiously abstained from as long as possible. But in order that we may have the matter clearly before us, let us refer to the published opinions of some of our latest authorities on the subject. Dr. Collins, quoted by Dr. Churchill, observes: Let it be carefully recollected, at the same time, that so long as the head advances ever so slowly, the patient's pulse continues good, the abdomen free from pain on pressure, and no obstruction to the removal of the urine, interference should not be attempted unless the *child be dead.*" Churchill himself, writing in 1860, takes exception to this rule to some extent, and says that "when the second stage has lasted so long as to prove the inadequacy of the natural powers, or at all events as soon as the symptoms of a prolonged second stage make their appearance (quick pulse, dry tongue, fever, etc.), then we ought promptly to interfere." (Midwifery, 4th ed., p. 350.) Dr. Murphy, in the second edition of his work on Midwifery, published in 1862, sums up his observations on the use of the forceps thus, "When the head is passing slowly through the cavity of the pelvis, interference with the forceps is not called for, because of the *time* occupied, but rather because of the *special conditions* of the case. The use of this instrument is only justifiable when some clearly proved necessity arises; the time occupied in a labour is, *ecipso*, no justification," &c. (p. 280.) Lastly, Dr. Hall Davis, writing in the present year, says: "So long as the head advances with the pains, and recedes on their retirement, the patient is safe from dangerous pressure on her soft tissues. If, on the contrary, the head has been *wedged in the pelvis in one position, under strong parturient action*, for five or six hours, we are bound, as a general rule, for the safety of the lives concerned, to extend our aid." (Parturition and its Difficulties, p. 72.)

These, then, may be taken as an example of the dicta of our authorities at the present time, and, I take it, as the exponent of the usual practice at present pursued. I shall hereafter, however, call your attention to some exceptions to this on the part of several practitioners, who, to some extent, follow the course I now advocate. But these, I believe, are the rules which would be endorsed by the vast majority of our contemporaries in this country. We, therefore, find that we must do nothing whatever to assist a woman in an ordinary case of labour, not even though it may be lingering and tedious; but that it is only when we are absolutely compelled to do so, because of danger threatening the mother or child, that we may venture to interfere. (I leave out of consideration at present the use of ergot, because it is generally given without considering that the natural process is thereby influenced, and because it is frequently inert.) No matter though the os uteri have been fully dilated for six or eight hours, and the child be still unborn, still, unless symptoms of inability or exhaustion present themselves

we are enjoined to wait on. Though the patient have been in strong labour for three or four hours after the rupture of the membranes, still, if progress be made at all, grave constitutional symptoms must have begun to make their appearance ere we should be warranted in interfering. Though we may have waited patiently near the bedside from nine in the morning till three in the afternoon, still neither does this matter. We must exercise our patience, and wait on still. Now, I would ask, why this reticence? Why this timidity? This is the point on which I am at issue with our authorities. Let me narrate a case or two, and apply the question to them.

Mrs. Smith progressed favourably till the os was fully dilated, when her pains began to come on less frequently, and the head entered the pelvis very slowly. Soon they died away altogether, and for half an hour no progress was made. A dose of ergot was then given, and not long afterwards the pains returned; but they were slight and inefficient. So they continued for an hour or more, when stronger pains set in, and in four hours from the beginning of the second stage, the child was born.

Mrs. Jackson sent for her medical attendant at 8 a. m. On arrival, he found the second stage fairly commenced, and pains coming on of fair strength and frequency. A speedy termination of the labour was considered probable. It was soon found, however, that the head did not make the progress it might have been expected to do; it advanced very slowly. Every morsel of ground was, as repeated examination showed, gained with great difficulty. Still the pains continued, one perhaps every five or ten minutes, and, on the whole, progress was made. The patient frequently complained and begged for help, but was told that all was going on well. Ergot was administered without much appreciable effect; and it was only after three and a-half hours' hard, continued labour, that the delivery was completed. The child gave some difficulty in getting respiration properly established.

Mrs. M'Donald did well till the head was presenting under the arch of the pubes. Pains continued, but the head made no apparent progress. It came forward with each, but immediately receded to its former position when the pain passed off. This went on, more or less, for a whole hour in a very teasing manner, the attendant often mentally assuring the child's head, that if he could only get hold of it with his fingers and thumb, he would make short work of it. This, however, he did not do. The patient became tired and querulous. The pains diminished in frequency, and for half an hour nearly stopped, when two good strong ones occurred, which expelled the child.

Mrs. Mackie was taken in labour of her first child early on Monday morning. Her attendant saw her several times during the day, and the first stage was completed about five in the afternoon. She continued to have good pains, and the head descended gradually to the perineum, occupying an hour and a-half in doing so. The pains then left her, but recommenced in three-quarters of an hour. They continued pretty frequent and of good strength; but the tissues of the vagina were rather rigid, it being her first case, and it was only after another hour's continuous labour that the child was born. All along, the patient exhibited great restlessness and anxiety, particularly during the last two hours. She tossed herself about and cried loudly for help, defying all attempts to pacify her; so that it was a matter of satisfaction to all when the labour was over.

Now, these are all cases such as we are constantly meeting with. A large proportion of our practice consists of such, or of others very similar. In all of them the natural powers are quite sufficient to complete the case, if we wait long enough, and the mother and child are daily reported to be "doing well." But I would ask, Why are we so terrified to lend nature a helping hand, when we see very well that she is in difficulty, and when so much suffering and anxiety are being endured? Why do we not step in and have the case easily finished in a few minutes, instead of allowing it to go on for two, three, four, or five hours? I go no further than this. I leave cases protracted for a third, or a half, or a whole day, out of the question, and would ask, Why allow any case to go on for the space of even *one hour* after the first stage is completed? Would it not have been more consonant

with an intelligent perception of physiological facts to have supplied a substitute for the evidently too inert uterus in the case of Mrs. Smith, or to have helped it in its laborious efforts to overcome the evidently too narrow or rigid outlet in the cases of Mrs. Jackson or Mrs Mackie? And would there have been anything very dreadful in the surgeon's carrying out his wish in the case of Mrs. M'Donald, by inserting a pair of "steel fingers," and bringing his tormentor into the world at once? I am unable to give a satisfactory answer to these questions, nor do I believe that it can be shown that the truest and soundest practice would not have been carefully to have finished the labour in each case by instrumental assistance.

No one was a firmer adherent to the policy of non-interference in midwifery than was I at the beginning of my professional career; and never did one act more honestly according to his creed than did I. And yet if such cases as I have narrated occurred to me now, I would assuredly use the forceps in each of them. I believe that there is far too much made of the danger of instrumental delivery. Women have the idea that it is something by all means to be preserved from; they speak of some friend having had to be delivered instrumentally, in an under-tone; they get flurried in the lying-in-chamber when the subject is mooted. Medical men, too, to a large extent, share in this feeling, and in some degree it is quite justifiable; for instruments are so rarely used till pathological symptoms have manifested themselves, that we must conclude that, when they are proposed, the patient is in some danger. I believe, on the contrary, that with proper care and undivided attention, the forceps are a most *harmless, safe, and altogether admirable adjuvant in everyday obstetric practice.* As such, I would strongly recommend them, and to do my endeavour to uproot the strange idea that we are bound to leave our patient to her own efforts till her safety is endangered, and to some extent to save suffering is the object of this paper.

Since my practice was influenced by these views, I find that, in the last 100 cases I have attended, I have used the instrument so frequently as in 28 of them, or in about 1 in every 3½ cases. In 5 of these cases, the head was still above the brim when I applied the instrument. I can also recall some in which I was only prevented by questions of policy from having recourse to it. To say this is, of course, to say that I rarely go to a case of midwifery without taking the forceps with me. I do not use them to obviate danger, but to abbreviate anxiety and pain, and because I am convinced that I can do so with perfect safety. If there appears to me the slightest hindrance to the ready passage of the head, either from narrowness of the canal, or deficient uterine action, I make no hesitation about the matter, but apply the forceps, and finish the case. Of course, one has to be guided in his mode of manœuvring by the character of the patient; for, although we may often enough be entreated by herself to give her assistance, still this is not the most common case we meet with. Many have had natural labours previously, and see no reason why they may not again; and then, also, the firmly-rooted prejudice has to be contended with. It is thus sometimes necessary to explain everything, and have full permission, while, in other cases, I have used the instrument without the patient's knowing anything about it till extraction was being accomplished. Let it be done calmly, and with great deliberation. There must be no "fussiness" about it, but it must be made quite light of, as if a matter of every day occurrence. It is a good plan never to let the blades come in contact with each other outside the pelvis, so that the metallic noise, always so disagreeable to a patient, may be avoided. I therefore carry them in a bag, with a compartment for each blade. If short forceps, such as Simpson's modification of Ziegler's are used, which do very well when the head is just at the outlet, the whole operation can be accomplished with the utmost quietness and ease. Generally, I prefer Simpson's combined long and short—partly because they suit any case, and partly because I have become accustomed to them. I have only to complain of their bulk and weight.*

* Mr. Young of Edinburgh has described to me a modification of these, which he has devised. The shank is in two pieces, which dovetail into each other. Union is made complete by means of a ring,

It is necessary, however, that we should notice certain *objections* which may be brought forward against such frequent use of the forceps as I here advocate. First of all, certain *dangers* are said to be incurred by their use, —such as that the *soft parts of the mother may be injured* in their introduction; that the *perineum may be lacerated;* that, by withdrawing the child too rapidly, *the uterus might not contract properly.* Now, with regard to the risk of injuring the maternal passages, I believe there is a great deal of misconception. We have been taught that forceps are dangerous, and believe it, without testing the truth. Undoubtedly, if reserved for labours in which the head is impacted in the pelvis, and the tissues have become swollen and inflamed, or in which the patient is otherwise in a state to give rise to anxiety, there may be danger, either real or apparent, from their use. In such cases, I can readily understand that it may be a difficult matter to introduce the forceps without some amount of bruising, or that the dragging of the child through the narrow and inflamed passage may produce mischief; and I can, to some extent, sympathise with Dr. Davis, and the authors I have quoted, in their doubt as to whether the case should be further left to the natural efforts, or be treated by the forceps or by the crotchet. But I am altogether at variance with them as to the propriety of allowing such states to supervene. *The head ought never to become impacted, nor the tissues swollen.* If this be guarded against, and the forceps be used while there is abundance of room, then I maintain that there is absolutely no danger from their skilful employment; and I might appeal to the recorded testimony of many writers in corroboration of this, and to that of any one who has used them in such circumstances. Using the forceps in natural labour, and using the forceps in protracted labour, are two entirely different things; but almost every writer has shut his eyes to this consideration. With the latter condition I have at present nothing to do.

No doubt it is quite a possible matter to push a blade through the vagina, or to take hold of the cervix uteri as well as the child's head, but such mishaps must not be attributed to the forceps. The responsibility lies at the door of the operator. The simplest procedure may clumsily become the cause of death. "To reason that such effects are the necessary concomitants of the forceps is very much the same as it would be if we were to say that, because, in the operation of lithotomy, nervous or inexperienced operators have cut deeply into the rectal pouch, and becoming confused, have not been able to open the bladder at all; therefore that the operation for stone is one which ought not to be performed." (Mr. Harper, in paper alluded to.) And yet, although a certain amount of neat-handedness is desirable in all surgical procedures, I cannot think that any unusual dexterity is requisite for the safe use of the forceps. It has always appeared to me so perfectly simple that I am at loss to understand how such unfortunate accidents can have occurred. Yet a few are on record. Are our teachers not to blame? How many students are taught how to use their hands?

That the perineum is liable to be ruptured is one of the most frequent objections. As far as my own experience goes, I cannot admit it as one. It is true that in one case which impressed itself on my mind at the time, the perineum was injured to a considerable extent, but this was owing to the neglect of the precautions necessary to obviate it. The perineum must always be well supported, and great care must be taken to turn the handles of the forceps well over the pubic arch during extraction. On no account should traction be made in the long axis of the body at this stage. In the case referred to, the patient was very restless, and I, being somewhat hurried on this account, failed to bestow proper attention on these points. The perineum was long, and would undoubtedly have given way even had I not interfered, but I imagined that I had made it worse than it might have been. In no other case—and I occasionally make an examination on purpose to ascertain this matter—have I met with more than the slight tear which, as Sir J. Simpson has shown, is the usual accompaniment of natural labour. This

which passes over the place of junction. These may obviate to some extent the former objection. The instrument was alluded to in a recent number of this Journal.

latter fact must be borne in mind, for if after using forceps we find the perineum has lost its integrity, the instrument must not therefore be necessarily blamed. I am not sure that straight forceps are not objectionable on account of a risk of this accident. The posterior corner of the point may project beyond the head, and, in turning them over the pubes, this may press injuriously on the already tightly stretched tissue. With curved forceps this is impossible.—*Edinburgh Medical Journal, Dec.* 1866, *p.* 510.

82.—A CASE OF HYDATIDS OF THE UTERUS SIMULATING PREGNANCY AND NATURAL LABOUR.

By R. Lee, Esq, South Molton.

The following very interesting case of hydatids of the uterus, which came under my care a short time since, you may think, perhaps, worthy of publication.

A lady, aged 21, who had been married about a year, sent me notice that she wished me to attend her in her first confinement, which, she expected, would take place in about two months; but, as she did not feel well at the time, she expressed a wish that I should visit her. I did so, and found her suffering from hemorrhage from the womb to a trifling extent, for which I ordered an astringent mixture of dilute sulphuric acid, with infusion of roses, and, as there were occasional pains in the back, a dose of morphia at night. In a couple of days she was herself again—the hemorrhage had ceased, and she was quite comfortable.

I was informed that she had seen nothing of the menstrual discharge for seven months, that she felt the child distinctly; and her size appeared to be that of a person seven months gone in pregnancy. The patient appearing quite well, I ceased visiting her, and took no further notice of the case, until about a month afterwards, when I was again sent for, and found all the former symptoms, which were soon relieved by the same remedies.

I then made a more minute examination. The bosoms were enlarged considerably, the areolæ around the nipples were well marked, and the size of the abdomen was natural for a woman eight months advanced. I could detect no fœtal heart, but I have before been disappointed in doing so; consequently I thought little of that circumstance. She informed me that she was positive she felt the child every night on going to bed, and frequently during the day time; that she had suffered very much from morning sickness during the first four months, and that the menstrual discharge had been always regular before the last eight months.

From this time I heard nothing more of her until the expiration of about another month, when I was sent for in a great hurry, the messenger saying that his mistress was in labour and very ill. On arriving, I found my patient very prostrate from excessive loss of blood, the pains severe, coming on at regular intervals of about three or four minutes, and with every pain a gush of blood. I immediately examined her, and felt what I at first thought to be a placental presentation. The os uteri was fully dilated, and a pulpy mass was presenting; the hemorrhage was very great; the pulse at the wrist scarcely perceptible, and I thought it a matter of life or death in a very short time. I immediately passed my hand into the uterus with the intention of turning, if a head presented, and delivering as quickly as possible. To my discomforture and surprise, I found there was no child, but an immense mass in the uterus, a part of which had now got into the vagina, around which I could pass my hand. The uterus contracted as freely and powerfully as if in natural labour, and with some little difficulty I removed it in one huge whole. It nearly filled a large washhand basin, but unfortunately I neglected to have it weighed, so that I cannot tell its exact size. It was an immense mass of hydatids—thousand of watery vesicles, hanging together like grapes on a bunch, with a substance between somewhat resembling the body of a placenta. There were a few shreds of membrane attached to it. After its

removal the pains and hemorrhage ceased, the uterus contracted freely, and the discharge continued just as after a natural labour. The secretion of milk came on copiously on the third day, and I never saw the slightest difference in the symptoms from those of a woman who had been confined after the full period of gestation.

After witnessing this case, I should be very careful in pronouncing an opinion that any woman had given birth to a child, forming an opinion from the usual symptoms that present themselves subsequently to confinement, as, after an extensive midwifery practice of thirty years, I have witnessed symptoms in this patient which, had I been previously called in to a similar case after the expulsion of the hydatids, not knowing that such had taken place, and having to judge alone by what I then saw, I must confess would have led me to the conclusion that the woman had been delivered of a child.

In a medico-legal point of view this is a case of great importance, as medical men are so frequently called upon to give evidence in cases of supposed concealment of birth, and to have to rely so much on the secretion of milk, the common lochial discharge, the state of the bosoms, and the contraction of the uterus, in forming their opinion; and, judging from this case, I presume that no practitioner would be justified in giving a decided opinion from any or all of the symptoms described above without some other collateral evidence. I believe such cases to be very rare, and that if any of my medical brethren have seen similar ones they will confer a great benefit to the profession by publishing them, no matter whether they have been deceived in their diagnosis or not—*Medical Times and Gazette, Dec.* 22, 1866, *p.* 662.

83—CONCEALED ACCIDENTAL HEMORRHAGE AT FULL TERM; FORCEPS; POST-PARTUM HEMORRHAGE ARRESTED BY ETHER SPRAY EXTERNALLY; RECOVERY.

Case under the care of Dr. Braxton Hicks.

It was a noticeable feature in this case that the pulse was not at all increased in rapidity till the child's head was at the vulva, when it rose to 120 per minute, as might have been anticipated, in cases of blood-loss, and at which rate it continued for some days. Dr. Hicks remarked that this was in keeping with what he had suspected in other cases—viz., that the extreme severity of the symptoms was greatly owing to the impression made upon the nervous system by the great tension of the uterus; in one case noticed by himself the peritoneal coat had been actually cracked. The effect of the ether spray was exceedingly good; as an elegant mode of producing external cold, it commends itself at once, to say nothing of the readiness and certainty with which it can act.

Mrs. D., aged 21, primipari at full term. Having been busy washing the day before, she was taken at eight a. m. with a slight loss of blood, which soon stopped. At nine a. m. she was seen. The os uteri was not larger than a shilling, and the uterus seemed to be acting slowly. The pulse was then natural. As time advanced she became weaker: and was in a state of syncope at eleven a. m., with restlessness and marked pallor. This continued till half-past twelve, when Dr. Hicks saw her. The os was then the size of a five-shilling piece, thin, and dilatable. The head of the fœtus was pressed down firmly into it. The fundus of the uterus was large, tense, and firm. Much distress was evinced by the patient, with jactitation. The pulse was then about normal in beat, but weak, and on two or three occasions during the morning it had been nearly imperceptible. No bleeding externally was then going on. The membrane had ruptured two or three hours before. Dr. Hicks considered that there was a large clot retained at the upper part of the uterus, which was distending it, and pushing down the fœtus. He thought that with frequent stimulants and support she might be left without interference till the full expansion of the os uteri, upon the occurrence of which he advised employing the forceps gently to assist the

uterus, now over-distended, and thereby enfeebled. This was done; and in about three hours, when, as she seemed improving, it was thought possible she might get through without assistance. However, no great progress ensuing, the resident obstetric clerk, Mr. Harwood, applied the short forceps, and employing gentle help, the child was soon born. A great quantity of blood and several large clots followed. Pressure was applied to the uterus throughout, and the placenta followed, with another large clot attached to its margin. The uterus then contracted well, but speedily relaxed. Hemorrhage reappearing, cold was applied externally by the *ether spray*. The uterus instantly contracted, and so continued.—*Lancet*, *Feb.* 9, 1867, *p.* 175.

84.—ON CONSTRICTION OF THE CERVICAL CANAL.

By Dr. E. J. Tilt, Consulting Physician to the Farringdon Dispensary.

In a paper lately read at the Obstetrical Society, I protested against the abuse of the knife in uterine pathology, and against the too frequent division of the cervix; and the discussion that ensued has suggested the following remarks on the pathology and diagnosis of stricture of the cervical canal.

In the onset of such an inquiry one is startled by Dr. Head's assertion, that stricture of the cervical canal is almost always spasmodic, for he asks, "Who has ever seen in the dead-house the cervical canal strictured by hard nodular tissue similar to what constitutes stricture of the urethra?" To this question I have no hesitation in replying that I have occasionally seen in the living subject stricture of the os uteri and of the adjacent part of the cervical canal, when the cervix has a conical termination, as a persistent condition, unconnected with a spasmodic action; and to these cases Dr. Barnes has drawn our attention in a valuable paper. With respect to permanent stricture of other portions of the passage, I ask Dr. Head if he has ever looked for it in the dead-room, or whether he knows this to have been extensively done in any public institution? Patients do not die of cervical stricture, and the womb is not always examined when they die of other diseases. It would be more correct if I said that patients only die of cervical stricture when it leads to retention of the menstrual flow—cases which have been greatly elucidated by the researches of Dr. Bernutz, and in which the stricture was so little spasmodical that the cervical passage was entirely closed in some one part of its extent. This generally takes place at the os externum, but sometimes in its entire length, as in the remarkable case in which Dr. Debrou tunneled through the cervix, and succeeded in making a passage sufficient for the menses to pass, and for conception to take place. I therefore agree with most pathologists in admitting that the cervical canal, lined by a mucous membrane, liable to inflammation and to ulceration, constituted by walls of dense structure half an inch thick, and susceptible of induration, is frequently strictured by a structural development, and not by the spasmodic contraction of the circular fibres of the cervix. I do not see why cervical spasm may not occasionally exist independent of any organic disease, but I think it generally depends upon some structural lesion hidden in the depth of tissues, beyond our field of vision. Spasm as a complication of some more tangible cause of mischief I freely admit, and I think credit is due to Dr. Head for having more forcibly drawn attention to this element of disease, susceptible of elimination by proper treatment. I feel convinced that many of those who are not sufficiently impressed with this fact will find stricture where others could not, and that this error of diagnosis has caused the neck of the womb to be divided much more frequently than is necessary.

Many reasons militate in favour of the belief that spasm is a frequent complication of cervical stricture. The belief has, in the first place, a physiological basis in the fact of circular muscular fibres entering largely into the structure of the cervix; and there is no good reason for denying them the liability to that morbid contraction which constitutes spasmodic stricture of the œsophagus, of the urethra, and of the rectum. Besides this, the inner portion

of the body of the womb is separated from the cervical canal by a muscular ring, which Dr. Henry Bennet has called the os internum. It is the contraction of this circular band that closes the cavity of the healthy unimpregnated womb; so that, even when there is no stricture, the sound passes it with difficulty. The closure relaxes for a time to let the menstrual flow pass, and, during the collapse of connexion, to facilitate the passage of semen to the internal cavity of the womb; and it may be taken as an established fact that the os internum becomes permanently relaxed whenever the body of the womb becomes seriously diseased by one form or another of internal metritis, and by the presence of adventitious growths.

We often bring on spasms of the cervical muscular fibres by introducing the uterine sound; whereas, if previously warmed, it passes without difficulty. We sometimes induce a spasmodic state if we blunder in our first attempts to pass a wax bougie through a strictured cervix. For spasms of the rectum it is recommended to leave in the passage metallic suppositories; and I have occasionally found that the presence of a foreign body in the cervical canal for a short time may deaden its sensitiveness. Lately I have had two patients who suffered severely from obstructive dysmenorrhœa; one for eight, the other for five, years. I was only able to leave in the cervix for a few hours, on alternate days, a bit of No. 2 wax bougie—three times in one case, twice in the other,—when the treatment was interrupted by the menstrual period, which was, nevertheless, painless.

The evidence of spasm as a complication of stricture is shown by the efficacy of antispasmodic treatment. The grand utility of opium, henbane, of belladonna, either given internally or as suppositories by the vagina or rectum during the first twenty-four hours of menstruation, has been taught by the great men who preceded us; and by this mode of practice I have repeatedly enabled patients to menstruate with little or no pain who would otherwise have suffered greatly, because it was difficult to introduce a No. 2 bougie into the cervical canal. Dr. Head has lately stated that he was able to cure the severest cases of dysmecnorrhœa by introducing the vapour of chloroform into the womb; and by explaining this mode of practice, and substantiating it by cases, he would help to check the too frequent performance of operations that he considers to have been often uncalled for.

With regard to the seat of stricture, I have found it near the os externum, in the mean portion of the cervical canal, and at the os internum: so I am not surprised that pathologists should differ on this point. I have found it most frequent at the os internum; and this agrees with the experience of Dr. H. Bennet and Dr. A. Farre, and also harmonizes with Dr. Head's opinions respecting the spasmodic nature of cervical stricture.

[It is an imperfect diagnosis which leads surgeons to divide the cervix so much more frequently than is warranted by sound pathology. Inflammation and congestion must be removed by depleting the wound, and by the use of agents which substitute healthy for diseased nutrition of tissues. Many a case of dysmenorrhœa supposed to be obstructive will yield to persistence in the intelligent use of these measures. When all traces of inflammation are removed, it is time to infer that dysmenorrhœa depends upon some obstruction to the free passage of the menses, and this can only be ascertained by probing the wound.]

When a resistant probe is required, I prefer Chassaignac's uterine sound, which is shorter than Simpson's, and only slightly curved at its extremity; but for ordinary use there is nothing better than the well-known wax bougies; they seem to have a peculiar aptitude to pass through the strictured canals, and I have often been able to pass one when I have failed with the uterine sound, the calibre of the two instruments being the same. Another great advantage of using wax bougies is, that it is difficult to do harm with them. If they cannot pass the stricture, they bend and are expelled by the womb, whereas the uterine sound often causes great pain and loss of blood, sometimes inflames the womb or the surrounding tissues, and has been repeatedly known to perforate the womb used by inexperienced hands. No one should introduce a bougie, and still less a metallic sound, into the womb, without

previously ascertaining its shape and position, so as to know what curve it may be useful to give the probe, and in what direction to introduce it. It must be particularly ascertained, by means of the finger in the vagina and sometimes in the rectum, whether the body of the wound is not flexed upon the cervix: for those who do not detect this condition will of course find great difficulty in passing the sound, or may not be able to do so, and may subject their patients to useless treatment by sponge tents, as I have seen in several instances. It will be obvious that in cases of this kind the wax bougies are of much safer use than the rigid metal rod, and if the wax bougie be carefully brought away, it will, to a certain extent, bear the impression of the curve in which it has been moulded.

With regard to the dangers attending the division of the cervix, they will depend upon the extent to which the division is carried. If the cervix has been divided right and left, down to its vaginal attachments, one cannot be too careful of the patient for the following days; but this is very seldom required. In the majority of cases in which one or two longitudinal incisions, to the depth of two or three lines, are made inside the cervical canal, particularly when the os internum is not divided, or when the os externum and adjacent tissues are thoroughly divided to the extent of three-quarters of an inch, it is quite unnecessary to subject the patient to the fuss and expense of a skilled nurse, or to enforce silence, and keep the patient in bed for three weeks, as if some fearful operation had been performed. Common sense will teach the happy medium between foolhardiness and a ridiculous amount of precaution, and I am desirous of saying this, for I have exaggerated the dangers of the operation in my "Handbook of Uterine Therapeutics."—*Lancet, Dec.* 8, 1866, *and Jan.* 26, 1867, *pp.* 631, 112.

85.—THE TREATMENT OF ENDO-METRITIS BY UTERINE SCARIFICATION.

By Dr. Erasmus D. Miller, Dorchester, U. S.

The object of the present essay is not to inquire into the pathology of endo-metritis, nor to discuss special affections resulting from chronic inflammation of the lining membrane of the uterus, to which intra-uterine scarification has proved serviceable, but to set forth concisely the means and method of its accomplishment, and the principles upon which it is based; that a more extended observation may establish, or otherwise, its claim to be regarded not merely as a *new*, but a recognised principle of treatment in uterine surgery.

The means by which it is accomplished is Lallemand's urethratome, modified by the addition of a probe-point, and an elevation (D) two and a half inches from the point, about the average length of the cavity of the healthy womb. It consists of a steel tube (slightly curved between the point and the elevation), fenestrated on one of its sides, in the distal end of which is an inclined plane. A knife (D), half an inch long and one-sixteenth wide, on the end of a staff, which, when pushed forward, rises on the inclined plane through the fenestra. A sliding knob (B), by which the staff is fixed and the depth of the incision regulated; and a set knob (A), which holds the knife concealed while the instrument is being introduced.

As the necessity of the case requires that the scarificator be passed to the fundus of the uterus, it is to be presumed that those who condemn the common use of the uterine sound, will, for *apparently* more cogent reasons, condemn the former. But inasmuch as the scarificator and sound are nearly identical in form, and as the use of either requires the same delicacy of touch, and alike definite conception of the relative size and position of the uterus, and as

the pain and danger of inflammation consequent upon the use of the one (the knife being always concealed), is no greater than that of the other, the testimony of Dr. West with regard to the sound will apply with equal force to the scarificator. "The introduction of the sound causes some pain, though this is generally by no means severe, and is almost always of short duration; and *in no instance* that has come under my observation have dangerous consequences resulted from its use, though awkwardness and foolhardiness have, I know, done mischief with this, as with almost every instrument that has been ever invented."—WEST *on the Diseases of Women, p.* 28.

As a general rule the passing of the scarificator, other things being equal, will be the most readily and safely effected, in proportion as the uterus retains its normal position, and vice versâ; consequently, if it be deviated or flexed, the first indication will be to reduce it by elevating the fundus, and there to retain it with the cervix resting against the left index finger, along which the instrument is to be guided through the os into the cervical canal. Should its point, as frequently happens, become arrested at the junction of the cervical and uterine canals, the obstruction is not to be overcome with force, but the fundus is to be again elevated, at the same time the scarificator is held gently but steadily between the thumb and finger, against the point of resistance; or the end may be obtained by pressing the *side* of the scarificator with the index finger firmly enough against the wall of the cervical canal to draw the cervix downwards, by which the longitudinal axes of the body and neck are made to correspond; in other words, the crooked canal becomes straight.

The point of the scarificator having reached the fundus, loosen the set knob, push forward the staff, and having secured it, incise the membrane, by drawing the knife, steadied by the finger, the whole length of the uterine cavity, repeating the operation as many times as the case in the opinion of the operator may require. Occasionally the operation is followed by a free flow of blood, but more commonly it is scanty, continuing for a couple of days and corresponding in quantity to the usual amount of healthy menstruation for a similar period. The pain is slight if the knife is *sharp;* but if dull, is proportionate to the degree of pressure requisite to make the incisions. * * * *

Five years have now elapsed since the practice was first adopted, and in the very many instances in which the operation has been performed, I cannot call to mind a single case followed with inflammation to any extent, and in two only has hemorrhage required interference. I therefore regard the mere incising of the lining membrane of the uterus a safe operation. * * * *

Scanzoni, West, Tilt, Hodge, and indeed most writers upon uterine therapeutics, speak of depletion by scarification, but limit it to the mouth and neck of the womb. Though the effects of inflammation of the uterine and cervical lining membranes are modified by the anatomical peculiarities of each, yet they are governed by the same laws, and to a great extent are amenable to the same principles of treatment. If depletion by scarification is productive of good in inflammatory affections of the cervical membrane, it is a legitimate inference that depletion by scarification of the lining membrane of the uturus will be followed by a corresponding amelioration of symptoms.

We are taught by writers to believe endo-metritis to be a rare form of disease. In the absence of positive evidence its frequency might be inferred, from the fact that a large proportion of patients refer their ill-health to pregnancy, labour, abortion, interrupted menstruation, &c.; changes affecting far more directly the body of the uterus and its lining membrane, than the cervix and lining membrane of its cavity, and giving rise to amenorrhœa, dysmenorrhœa, menorrhagia, hemorrhage, &c. * * *

An inflammatory condition of the lining membrane causes also an enlargement of the womb either by deposition of fibrin (usually called hypertrophy), or by arresting involution of the organ after labour or abortion: the increased weight of which causes deviations of various kinds and degree. These, excepting in extreme cases, or sudden dislocation from falls, blows, &c., the pressure of tumours, or distended adjacent organs, are to be regarded as *symptoms* no less than lumbar and hypogastric pains, leucorrhœa, &c., and are to be treated as such. That the severity of symptoms generally depends upon the amount of inflammation, rather than the displacement, is evident from the fact, that if the former is removed, the latter will cause little or no inconvenience; whereas merely retaining the uterus in its normal position by artificial supports, is at best only a temporary alleviation and in the end a positive injury. In virgins especially should they, as well as the speculum, be ignored, for those cases are rare indeed in which an ordinary degree of tact cannot diagnose by the touch the nature of the disease, and guide the application of remedial means.

Depletion, though the most important, is by no means the sole object to be attained by the treatment now proposed, neither is it intended to exclude other remedies either general or local, but to act in concert with them. * * * *—*Boston Medical and Surgical Journal, March* 21, 1867, *p.* 133.

86.—ON POLYPUS OF THE UTERUS; WITH DESCRIPTION OF A MODIFICATION OF THE ECRASEUR FOR REMOVAL OF INTRA-UTERINE GROWTHS.

By Dr. Lombe Atthill, Fellow of the King and Queen's College of Physicians in Ireland: Examiner in Midwifery, Queen's University.

The following brief details of the history of a patient who was placed under my care during the past summer, by my friend Dr. Head, will, I think, prove interesting, as offering an example of a life saved by the use of the sponge tent and ligature, while, at the same time, it tends to illustrate the difficulty of adjusting the chain of the ecraseur round an intra-uterine polypus.

She was an unmarried woman, aged about 45 years, and when I saw her was very weak, greatly emaciated, and presenting a remarkably unhealthy appearance; so much so as to impress the observer with the idea that she must be labouring under malignant disease. She suffered incessantly from sickness of the stomach, and for weeks past had never been free from hemorrhage. She stated that formerly she had been a very healthy woman, but that some eighteen months ago she began to perceive the catamenia, which hitherto had been in all respects natural, to become much more profuse; then that they returned at short and irregular intervals; and finally, as already stated, that she was never free from a sanguineous discharge. During the whole of this lengthened period she suffered but little pain, though at intervals severe paroxysms came on, caused evidently by uterine contractions, for they always terminated in the expulsion of clots, after which she experienced relief. She resided in the country, and there tried various remedies, mainly, I believe, tonics and astringents, which had been prescribed for her relief; but as they failed to check the hemorrhage, she came to town for further advice.

On making a vaginal examination I was surprised to find that the uterus was free from malignant disease. It was low in the pelvis, greatly but evenly enlarged, globular in shape, and very firm to the touch; the cervix was completely obliterated, and the os closed, admitting with difficulty the point of a uterine sound, which, however, once introduced, passed freely into the cavity of the uterus to the depth of nearly five inches; the existence of an intra-uterine tumour was beyond doubt, but whether it was a fibrous tumour or polypus had yet to be ascertained. I believe it would prove to be a polypus,

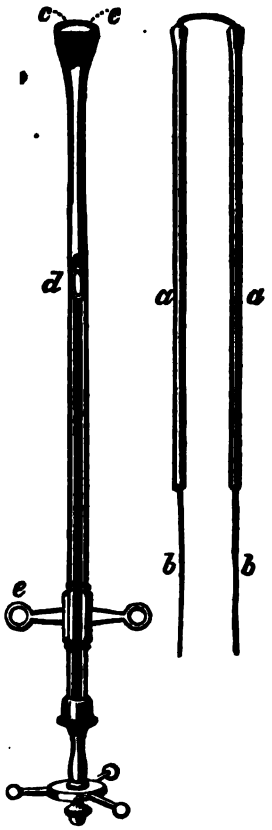
basing this opinion on the fact that the uterus was so evenly enlarged, and also on the absence of pain, which, as far as my experience goes, is a nearly universal accompaniment of fibrous tumours of the uterus. As the patient was in a very debilitated state, and losing blood rapidly, it was absolutely necessary to act promptly. I therefore proceeded without delay to dilate the os, and, after a little difficulty, succeeded in introducing into it a small sponge tent; this, on its removal, was found to have opened the os, so as to admit the tip of the finger; a larger tent was at once introduced, followed, on its removal, by one still larger, which completed the dilatation of the os to the size of a crown piece; this process occupied two days. The finger could now be introduced freely into the uterus and swept round the tumour, the attachment of which was very high up and to the right side. The diagnosis of polypus being thus verified, its immediate removal was decided on. Dr. Beatty and Dr. Kidd, who saw the case with me, assisting in operation. At the suggestion of Dr. Kidd, who kindly lent me the instrument, I determined to try Dr. Marion Sims' porte chaine ecraseur. The first step in the operation was to endeavour to draw the polypus partially through the dilated os; for this purpose a double hook was fixed in it, but the pedicle was so thick and dense that it was quite impossible to accomplish this; the hook, however, as it is served to steady the uterus, was not removed till after the operation was completed; the end of the ecraseur was now introduced into the uterus, and I succeeded, without difficulty, in carrying the chain to the fundus, and consequently beyond the attachment of the polypus; but the moment I began to expand the spring blades the difficulty commenced. for the uterus, probably from its never have been impregnated, was most unyielding; and though I twice succeeded in expanding the blades, the chain on each occasion became displaced, and slipped off the spring blades, and I consequently failed to secure the polypus. I now made an effort to use an ordinary wire ecraseur, carrying the wire up by means of a gum-elastic catheter; this plan, however, failed also, and as it was evident that the patient would speedily sink from the effect of the hemorrhage unless we could remove the polypus, I had recourse to the canulæ of Gouch, and with them, though not without considerable difficulty, succeeded in passing a strong ligature of double whipcord round the pedicle; once however applied it never slipped; and having been moderately tightened, was secured; the patient was greatly exhausted after the operation; some vomiting followed, which was checked by ice, and a tolerable night's rest was secured by an opiate enema. On the following and succeeding days the ligature was tightened, morning and evening; this was most satisfactorily effected by means of a small winch, which Dr. Beatty has most ingeniously adapted to the end of the connecting rod of the canulæ, and which, when sufficiently tightened, is secured by a screw; this worked admirably, and saved much trouble.

Five days elapsed before the ligature cut through the pedicle, and even then the polypus remained in utero. I succeeded, however, in extracting it with a pair of small forceps; it was then about the size of a large egg, but originally must have been much greater; in structure it proved to be purely fibrous.

The woman recovered slowly, but after the lapse of three weeks was able to return home convalescent.

This case, though presenting nothing very unusual, is instructive. We may consider the result eminently satisfactory; for, without doubt, this woman would have died had the removal of the polypus been delayed but a few days longer; but the means by which its removal was accomplished were not what we would desire; for though the dilatation of the os was rapidly effected, my failure in applying, first, Dr. Marion Sims' ecraseur, and subsequently an ordinary wire one, compelled me to have recourse to the old and objectionable method of the ligature, an operation only justified by the urgency of the case—an operation always disagreeable, and often followed by dangerous and even fatal consequences. In the present instance not only was the inseparable accompaniment of a very fetid discharge present, but I greatly dreaded the occurrence of blood-poisoning or some low form of peri-

tonitis, as the patient had more than one well-marked rigor, and vomiting returned almost daily. I therefore bitterly regretted my failure in applying Dr. Marion Sims' instrument; perhaps the failure was due to my own want of skill, but certainly I did not give up the attempt till I was perfectly satisfied that snare the polypus with that instrument I could not. The instrument though a very ingenious one, is complicated, and in a case like the present, where the vagina was very narrow and the uterus extremely rigid and completely filled by a very firm tumour, its application became simply impossible. These circumstances led me to consider whether a less complicated instrument could not be devised, which would unite to the great advantages attaining the rapid action of the ecraseur the facility of applying the ligature afforded by the canulæ of Gouch; and it occurred to me that if the extremity of the ecraseur were modified, so as to allow the ordinary canula of Gouch to pass through it, we would have a simple and efficient instrument. I have had an ecraseur, so modified, made by Weiss, and append a wood-cut to exemplify its application. With the canulæ *a a*, a wire rope, *b b*, of considerable strength, can be passed round the pedicle of the polypus; the canulæ are then to be passed through the opening *c c* in the extremity of the ecraseur; the ecraseur is then to be pushed up, guided by the canulæ, till it comes in contact with the pedicle of the polypus, filling the place exactly that the connecting rod of Gouch did in his instrument; the canulæ can then be entirely withdrawn, and the wire rope, being attached to the ecraseur at *e* and *d*, the operation is completed, as if we were using an ordinary wire ecraseur. If the engraving given here be compared with that in Dr. Gouch's work on *Diseases of Women*, it will at once appear that it differs from his instrument only in the substitution of an ecraseur for the connecting rod, but a great advantage is obtained in the power conferred by the ecraseur of enabling us to complete the operation at once, and thereby save the patient from the great dangers often following the application of the ligature in the old way: and I think if this simple modification of the ecraseur enables us to succeed in even but a moderate proportion of cases it will be no slight gain, and prove a useful addition to our obstetric instruments. I am well aware that cases will be met with which will resist the action of the wire rope, or break it; but they are rare; and if a strong twisted wire rope be used where the pedicle seems likely to offer much resistance to the action of the instrument, they will prove still more so. In conclusion, I wish to add that I do not desire to depreciate the merits of Dr. Marion Sims' ingenious instrument; but it is too complicated, and I feel that it is inapplicable to many cases. Dr. Braxton Hicks' instrument, too, though possessing the advantage of simplicity, will often fail in carrying the wire rope round the pedicle if seated at a distance from the os, and will always be difficult of application. I think that the modification I have suggested, which in reality is the adaptation of the canulæ of Gouch to the ecraseur, will be found superior, at least in facility of application, to any yet made.



The following case illustates how little inconvenience may, under certain circumstances, be caused by even large polypi—how slight may be the symptoms, and how nature sometimes effects a cure:—

I was requested by a nursetender to visit a woman, the wife of a cabman,

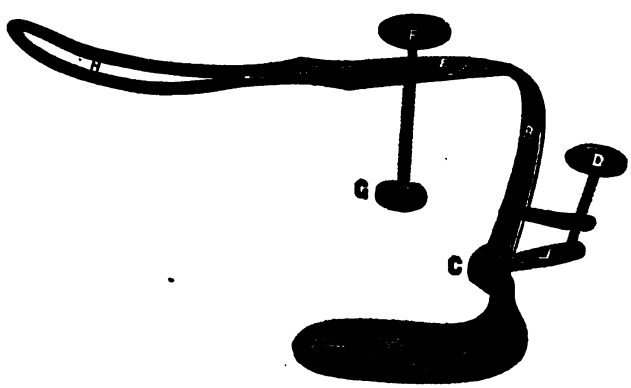
who, she informed me, had been confined under her care three days previously, after a natural labour, of a strong. well-nourished child. I found her to be a healthy, robust woman, aged about 30. She stated that when in the ninth week of her third pregnancy, having exerted herself to raise a heavy weight, she "felt something to give way inside" her, and immediately after perceived a tumour to protrude through the vulva; smart hemorrhage followed, but this soon ceased, and the tumour receded.

During the remainder of her pregnancy she continued to enjoy good health, and experienced no inconvenience unless she were to take a long walk, or make any unusual exertion, in either of which cases the tumour would again partially protrude, but it receded again on her lying down; there was also, on one or two occasions, slight hemorrhage. The midwife who attended her in her confinement, which appeared to have been rapid and easy, did not perceive anything unusual till, on the third day after delivery, she found a large mass protruding through the vulva—when, being alarmed, she came for me. I found, just as she described, a soft mass, of considerable size, lying in and nearly filling the vagina. At first I thought that was a portion of the placenta which had been left behind, it resembled it so much in appearance. but a careful examination proved it to be a polypus, which could be easily traced up to its attachment by a long and slender pedicle to the posterior lip of the os uteri; some hemorrhage followed the examination. As the woman was so recently delivered I thought it better to defer for a short time the removal of this polypus.

On visiting her again, after the lapse of two days, I found the pedicle shrivelled up, and the polypus itself begginning to decompose. I, therefore, divided the pedicle with a pair of scissors, at a distance of about half an inch from the os, and removed the mass, which proved to be a soft mucous polypus. The woman recovered without a bad symptom.—*Dublin Quarterly Journal, Feb.* 1867, *p.* 60.

SELF-RETAINING SPECULUM.

Dr. Geo. Syng Bryant describes (*St. Louis Med. and Surg. Journ.*, Oct. 1866) a modification of Sims' speculum which seems useful being self-retaining.



"This instrument consists of a blade *A* and lever *B*, with screws attached, so as to completely fit the lever to the sacrum and back, and to elevate or depress the blade at will.

This speculum operates precisely in the same manner that the Sims' speculum does, with the exception that it retains itself. The blade *A* is introduced into the vagina, and then connected with the lever *B* by the notched joint *C*. At the end of the fenestra *H* in the lever, a strap is attached which is to be

carried around the body or waist, and tied before the pad, upon which the button *G* rests, is to be placed upon the sacrum. Above the bend of the lever is a slide *E*, to which is attached a screw with a button *G* at the end. This button rests upon the pad on the sacrum, and the screw is then turned until the requisite amount of tension is made upon the perineum.

The screw *D*, at the lower end of the lever, which rests upon the arm *I*, of the blade, is now turned until the free or distal end of the blade *K*, is elevated or depressed, as may be desired, to the proper degree to bring into view the os uteri and the whole of the vagina, except that portion upon which the back part of the blade rests. This speculum is easily fitted, and its introduction is without pain to the patient. It was made by Leslie & Co., of this city, from a diagram. The accompanying cut is only one-third the size of the instrument."

Dr. B. states that when he contrived this speculum, he was not aware that Dr. Emmet, of New York, had previously modified Dr. Sims' speculum so as to make it self-retaining, but, though Dr. E.'s modification, he states, answers well in lean women, with a thin weak perineum, it does not do so well in muscular women.—*American Journal of Medical Science, Jan.* 1867, *p.* 282.

88.—PRURITUS PUDENDI SUCCESSFULLY TREATED BY SULPHITE OF SODA.

By Dr. Samuel B. Frizell, of Grangerbury, Ohio.

In September, 1866, I was consulted by a lady suffering from pruritis pudendi following menstruation—accompanied with great irritation and much pain.

Having read of the influence of sulphite of soda on sycosis menti, the idea suggested itself to me of trying the same in this case. I accordingly prescribed for her the following local application: Sodæ sulphis, ℥j, aquæ ʒiij, glycerinæ ℥j, M. which was to be used quite often. In three days no trace of the disease was apparent.—*American Journal of Medical Science, Jan.* 1867, *p.* 271.

89.—HEMORRHAGE FROM FIBROUS TUMOUR OF THE UTERUS; ITS NATURE, SOURCE, AND SURGICAL TREATMENT.

By Dr. J. Matthews Duncan, Honorary Member of the Hunterian Medical Society.

[There can be no doubt that our medicinal resources in cases of hemorrhage from the fibrous tumour of the womb are very unreliable. Most of us no doubt recollect cases in which we have tried almost all the likely drugs without any benefit whatever.]

In the run of cases of the graver sort, the practitioner has generally reason to doubt whether medicines do any direct good. Plugging the vagina is a mode of treatment useful only in cases of what may be called flooding, or severe hemorrhage, as distinguished from long-continued dribbling. Its use demands much attendance from the physician; and it is extremely irksome and painful to the patient. Of the plan of painting the bleeding surfaces, by the careful injection of a solution of the perchloride of iron by a small intra-uterine syringe, I have some reason to think well; but my experience is, as yet, not matured so as to justify me in speaking unreservedly in its favour. But, supposing the best, intra-uterine injectine can only be regarded as a palliative, and is available only if the services of a skilled practitioner are constantly at hand; and even then it requires repetition.

Such being the state of therapeutics in connexion with this important bleeding, it becomes the physician of the diseases of women to study the subject closely. It is, when enunciated, evident to all that, if we have failed empirically to cure a disease, we must, as science advances, apply its acquisitions, and find out a cure based on philosophical grounds. I know that any

contribution I have to offer to the science of this subject is very imperfect in itself, and far from being fit to be made the basis of general rules of treatment; yet I am sure that the method I recommend is the right one.

This method consists essentially in investigating anatomically and physiologically the whole history of this bleeding and applying the knowledge thus obtained to the improvement of its medical and surgical treatment; and, in so doing, taking care to keep ingenious theories and conjectures in their proper subordinate place. I know no author who deliberately sets the subject before the profession in this light, while many do not devote a line to the anatomy and physiology of the parts implicated in the hemorrhage.

Dr. M'Clintock, one of the most recent writers on this disease, may be cited as giving a correct view of the manner in which this hemorrhage is treated. "The reason," he says, "for this frequency of hemorrhage in connexion with fibrous tumours of the womb, has never been clearly and satisfactorily accounted for. A great many ingenious theories and conjectures have been put forward by different authors, and I shall not add to their number by proposing another. That the hemorrhage must depend, however, upon some peculiarity belonging to the uterus itself, is at once proved by the fact that hemorrhage is not a symptom of fibrous tumour in any other part of the body. That it does not always, or altogether, proceed from the surface of the tumour, abundant observation has shown; whilst experience teaches us, that the nearer the tumour is to protruding into the uterine cavity, the greater is the liability to the occurrence of hemorrhage."

The bleedings from fibrous uterine tumour may be divided into two kinds, passive and active. Of these the more frequent and ordinary is the passive. For patients suffering from this disease are soon rendered anæmic. Their blood is watery. It oozes away, often copiously enough; it is not actively discharged. It is a loss to the patient, not a relief. All this is evident; but a more important distinction among such hemorrhages remains to be made. They may be capillary, that is, from numerous vessels so small that their ruptured coats escape detection; or they may have their source in considerable venous sinuses temporarily or permanently open.

I have no doubt that, in a majority even of the graver cases, the hemorrhage is from capillary vessels, resembling the hemorrhage of ordinary menstruation, and having its source in the same vessels; that, occurring at monthly periods in women still ovulating, it is a menorrhagia differing from more usual forms of menorrhagia in its peculiar exciting cause. It is well known that, in some cases of fibrous tumour of the uterus, there is no loss of blood whatever. Of such cases I have here no occasion to speak. When extraordinary losses of blood do take place, there are, in varying cases, different explanations easily applicable.

First, The mere presence of the tumour in the organ, acting as an irritant, may increase and prolong the common congestion and hemorrhage of menstruation, or may produce these states apart from the periods of ovulation. This irritation is well known to increase according as the tumour is near the mucous membrane of the uterus, and it is natural to expect this result from its proximity; for, when such tumours become polypoid, or are true polypi, then there is still further increase of irritation and of congestion, and a more frequent attendance of hemorrhage upon the disease.

Second, It is readily conceivable that, entirely apart from irritation of the uterus, and specially of its mucous membrane, a fibrous tumour may cause and keep up capillary hemorrhage by mechanically impeding the returning current or currents of venous blood, as they pass though the uterine wall or broad ligaments, or great veins of the pelvis. This is not only a conceivable, but is rendered in some cases a highly probable cause, by the study of the analogous condition of pregnancy. In the latter condition, tendency to hemorrhoidal congestion and other venous diseases, in parts below the uterus, as well as to uterine bleeding, is not, I believe, always the result of mechanical disorders. But there can be no doubt that it often is caused or aggravated by such bad mechanism, and removed or relieved

by the simplest means for mechanically averting the evil, such as the use of posture.

Third, There is another explanation of the great capillary hemorrhages accompanying fibrous uterine tumour, namely, the existence in some cases of greatly increased extent of bleeding surface. Every pathologist is familiar with the very varying conditions of the uterine cavity in this disease. It is often distorted, often elongated, sometimes in addition greatly increased in real (not potential) capacity. Of all these conditions, examples are constantly occurring. Works on morbid anatomy supply numerous drawings illustrative of them. The source of menstrual hemorrhage is this mucous surface, and it is natural to expect that with the increase of its superficial extent the amount discharged should also be augmented. I see no reason for doubting that all the mucous surface of the body of the uterus, or of parts connected directly with it, such as the mucous membrane investing a fibrous tumour, yields the bloody flux.

Lastly, Among causes of capillary hemorrhage may be mentioned presence or misapplication of uterine contraction. Whether this be really influential in cases of this kind I am not prepared to assert. I merely suggest the investigation of the question for physiological inquirers. That, in the second great class of hemorrhages in connexion with fibrous tumour, it has a potent influence, I have no doubt.

Cases in which capillary hemorrhage occurs and in which the above-described causes operate in producing it, increasing it or continuing it, may be classified as cases in which astringents or other medicines administered by the mouth may be expected, at last, to have some power of restraint or arrest. By so classifying them, I do not imply that other means, even surgical interference, may not always be useful as hæmostatic remedies. It is probably to bleeding of this kind that Mr. Baker Brown alludes when he gives his opinion as to the rationale of some kinds of surgical interference, hereafter described.

The second class of hemorrhages in this disease is that from open venous canals. If the former class finds an analogue in menorrhagia, this class finds its analogue in the floodings of pregnancy, an analogy which future improvements in surgery may extend to the treatment of it.

The great anatomical fact, in this class of hemorrhages, is the close resemblance of the development or hypertrophy of the muscular tissue of the uterine walls, to that occurring in normal pregnancy. The muscular tissue and the uturine sinuses ramifying in it, and especially in the looser layers immediately surrounding the tumour, grow in a closely similar manner. Cruveilhier, whom no author has excelled in graphic description of the anatomy of this disease, decidedly overstates this analogy when he says in his great work on pathological anatomy (text accompanying Pl. vi. livr. xiii.), and elsewhere repeats, that every fibrous tumour which is developed in the thickness of the uterus, has, as a consequence, a hypertrophy and softening of this organ during pregnancy. The words, "represent exactly" are to be objected to as an error from want of care in statement, for Cruveilhier himself points out differences between the hypertrophy and softening in the two conditions. Much has yet to be done before exactness can be attained in the statement of these differences, but even now some may be noted. The uterine development in fibrous tumour is confined to the proper or muscular layer of the organ. At no stage of the disease (uncomplicated with pregnancy) is there any production of the wonderful decidual hypertrophy of its mucous membrane. The hypertrophy of the muscular coat is often, indeed generally, in interstitial tumours, greater than in a pregnancy of corresponding bulk. At no time before parturition is the proper tissue of the uterine wall seen of the thickness of an inch, as it may be found around such tumours. The same exaggerated size is observed, in many cases, in the uterine sinuses ramifying around a fibrous tumour. Both these differences may be due to the comparative long continuance of the morbid cause of hypertrophy, and perhaps to its essential unnaturalness or morbidity. Lastly, there are great differences in the shape of the uterus and in

the thickness of the different muscular layers, in cases of fibrous tumour, otherwise apparently alike.

"The venous vascular network," says Cruveilhier, "between a fibrous tumour and the tissue of the uterus, always considerable, even in fibrous tumours of small size, becomes truly prodigious when fibrous tumours have acquired large volume, and especially when they are œdematous. Thus, around an œdematous fibrous tumour, of the bulk of the head of an adult, I have found veins of the size of the little finger, filled with coagulated blood." It is bleeding from openings in these vessels that we have now to consider.

The *first* kind of opening that has been found is a simple round aperture, establishing a connexion between the uterine cavity and one of the large sinuses lying in the muscular tissue, enveloping a tumour. A case of this kind has been described by myself. I am not aware of any other quite similar, but the almost accidental discovery of the opening in the autopsy of the case recorded by me, suggests to me the probability that, even in dissections of uteri containing fibrous tumours, such an aperture, unless carefully looked for, may escape notice.

The *second* kind of opening which I have to describe may not differ greatly from that last given. Cruveilhier's description of the only case, which I know to refer to, is not precise enough to enable me to decide its exact nature. Yet I place it as a second kind, distinct from the first and third. It consists of "openings of the uterine sinuses, large, and occupying the lower part of the tumour." Cruveilhier's case furnishes fig. 2, pl. 6, livr. xiii, of his great work on pathology, and is described in the third volume of his Treatise of General Pathological Anatomy.

The *third* kind of open uterine sinuses is the result of partial expulsion of the spontaneously enucleated tumour into the uterine or vaginal cavity.

It may be just to regard these three kinds of bleedings as stages in a gradual process which may be called sanatory, inasmuch as the enucleation and expulsion of the fibrous tumour, if fortunately arrived at, may be regarded as its completion.

First, then, occurs a simple ulceration of the mucous membrane, investing the most prominent part of the tumour as it bulges into the uterine cavity. This ulcer is small, rounded, and establishes an opening into a uterine sinus. Secondly, the ulceration increases, and several openings are formed. Lastly, through the increase of the ulceration, the tumour is partially denuded: uterine contractions follow, and expelling the tumour through the opening in its investing wall formed by this ulceration, produce new lacerations of the sinuses, as they lie at the line of demarcation between the last separated portion of tumour and the adjoining uterine wall.

In all these three forms of open uterine sinuses, bleeding may be the escape of the whole or a part of the blood permeating the open sinuses. This bleeding may be intermittent in consequence of changes in the current of blood through the affected sinuses. The bleeding may cease in consequence of there being no blood for a time passing through the canals. The bleeding may return in consequence of the erect position, or the excitement of a menstrual period, or efforts in going to stool destroying the retentive power of the abdomen, and producing repletion of the affected vessels, which may have been previously quite empty. This kind of hemorrhage may be arrested by expulsive pains or other uterine contractions, and, consequently, ergot of rye may be a useful medicine in the circumstances. Uterine contraction, if affecting the open canals, may be expected to close them, compressing them between the tumour and the uterine wall. A similar action is supposed by Baker Brown and M'Clintock to be the cause of the hæmostasis following incision of the os and cervix uteri. This operation is said to "permit the fibres of the body of the uterus to contract upon the contained tumour, and thereby to compress the vessels and prevent hemorrhage."

But Cruveilhier points out that expulsive efforts may have, as a result, the laceration of the layer of looser tissue which immediately cover such tumours, and that if great vessels are present in the thickness of this layer, fatal hemorrhage may be the result of the laceration. Such hemorrhage may be repeated

with each repetition of the expulsive efforts. This statement of Cruveilhier's does not appear to me to fully describe the matter, and he does not, so far as I know, advance any case, carefully detailed, in proof or illustration of it. I have already said that I regard uterine action as, in some cases, hæmostatic or sanatory. I would ascribe hemorrhage to such uterine action, or efforts as result in some degree of expulsion, a change which cannot go on without laceration, unless it be the consequence of a slow process of enucleation with advancing ulceration at the line of demarcation between tumour and uterine wall.

The following cases are examples of the various states in which fibrous tumours are found, as true or false polypi, in the genital passages.

Case 2.—In the following case is illustrated the occurrence of a true fibrous polypus of the uterus. It is remarkable on account of the small amount of menorrhagia it induced.

Mrs. —— has never suffered from violent menorrhagia. She has recently had three successive pregnancies which have terminated favourably. Her last child was born ten days ago without any artificial assistance. During labour a globular tumour was felt in the vagina, attached to the right anterior quarter of the cervix uteri, and with very little constriction at the neck forming its pedicle. It was almost sessile and of the size of an ordinary hen's egg. I pulled the tumour gently downwards and excised it with scissors. A little gush of blood followed the excision, but was easily checked by a moderate amount of plugging. The tumour has an entire mucous and muscular coating, the latter thinning towards the end of the tumour remote from the uterus. She made a perfectly satisfactory recovery.

Case 3.—The next case is one of the somewhat rare kind of fibrous uterine polypus, which is a continuous outgrowth of the proper tissue of the uterus. It is the only case in which, among a large number of operations, I have tied the pedicle of a polypus. The ulcer on the polypus and the appearance of small openings in the venous ramifications on its surface are noteworthy.

Mrs. —— was placed under my care by Dr. Littlejohn. She had enjoyed good health until about three months before I saw her, at which time she had a miscarriage at the third month of pregnancy. Ever since then she had had a copious discharge, which she describes as consisting of blood and matter. A large elongated polypus protrudes partially from the vagina. It might be compared in size and shape to a flattened hen's egg, and its stalk of about an inch in length was nearly about half as thick as the body of the polypus. A considerable artery could be easily felt pulsating in the thick pedicle. I therefore tied it with silk, and then excised by scissors below the ligature. The case required no further care.

The polypus was entirely composed of the proper or muscular tissues of the uterus. It was therefore not an ordinary fibrous polypus, for its stalk was continuous with its substance and with the proper tissue of the cervix.

Near the pedicle of the polypus was a small ulcer on its surface. Under the ulcer, venous ramifications could be seen, having apparently small openings on its surface.

Case 4.—The three next cases are examples of the common spontaneously enucleated, but not disconnected, fibrous tumour, or false fibrous polypus uteri.

Mrs. R., æt. 49, had her last child nine years ago. For seven months past she has had great losses of blood at the monthly periods, and profuse leucorrhœa when bloody discharge is absent. Under these circumstances, she was sent to me by Dr. Paterson of Carnwath. A tumour, about the size of the clenched fist, occupied the roof of the vagina. It was easily pulled down and its attachment cut through. No hemorrhage followed. The woman made a good recovery.

The tumour was a lobulated fibrous mass, destitute of covering by mucous membrane or muscular tissue.

Case 5.—I was called by Dr. Myrtle to Mrs. ——. She was æt. 47, and childless. Four months ago, she suffered considerably from pain in the belly, and ever since then has had bloody discharge. A tumour, as large as

a hen's first egg, lies at the os uteri. I fixed it with a volsella, and removed it with curved scissors. It was a naked fibrous tumour.

The sixth case I shall give as a quotation from the reports of the Medico-Chirurgical Society.

Case 6.—"Dr. Matthews Duncan exhibited a uterine polypus of very large dimensions, which he had recently removed from an unmarried woman, aged 47 years. It measured five and a-half inches in length by four and a-half in breadth, and was of the ordinary fibrous structure. It was, as he had pointed out in former specimens, quite destitute of muscular or mucous coverings, being, in fact, an enucleated fibrous tumour which had been expelled from the uterine wall, its original seat, into the vagina, from which it was removed by operative interference. In this case, it was remarkable that, during all this growth, enucleation, and change of situation, the woman's health had been scarcely disturbed in the least degree. She had irregular vaginal discharges, but, as she had no suffering, she paid little attention to them. Indeed, it was not until the supervention of a cough, which forced the tumour down upon the outlet of the pelvis, and compressed the urethra, giving rise to retention of urine, that she had any complaint to make of suffering in the hypogastric regions."

"It is a mistake to suppose that the difficulty of dealing with these large polypi lies in dividing the (so-called) pedicle. In the present case, the pedicle could not be reached by the finger, until the tumour was removed from the vagina by traction. This was a very laborious process, effected only by repeated and persevering efforts, assisted by the bearing down of the patient. It was, indeed, a difficult labour in a primpara; only, instead of a child's head, a relaxed vagina, and labour pains, there was a fibrous tumour, an undilatable vagina, and traction by hooks fixed in the tumour. There was no difficulty in dividing the pedicle; for it snapped across as the tumour descended, and scarcely a drop of blood issued from it. If the pedicle had not broken, it would have made little difference in the operation; for the extent to which the easily movable uterus is dragged down in such a case is not considerable."

[It is, of course, only in those cases in which hemorrhage is large, grave, dangerous, and recurring, that surgical treatment is necessary. Dr. Duncan has never tried the foregoing plan of Mr. Baker Brown, as it has appeared to him a less satisfactory operation than the partial or complete avulsion which he describes in the present paper. (Mr. Baker Brown has now discontinued the plan of gouging the tumour, as he finds that pretty free division of the os and cervix is sufficient to arrest hemorrhage.)]

Cases, which have come under my observation, appear to me to justify the operation that surgeons have looked for too rapid attainment of the final removal of the tumour; that, while in some cases, enucleation may possibly be performed at a sitting, or in the course of a few days; in other cases, it may, without disadvantage, occupy months or years. An opening is artificially made in the uterine wall, or forms spontaneously,—the analogue of a rigid os uteri; the process of expulsion, spontaneous or artificially assisted, goes on slowly, the analogue of a tedious labour. It is natural to suppose that the denudation and slow expulsion of a considerable tumour should be very dangerous, apart from the loss of blood accompanying the process. Experience appears to me to negative this opinion. But even were it otherwise, art would not be quite without resources, for, as Lisfranc has suggested, the enucleated portion, or successive portions, may be removed, and the remaining immovable part waited for. I have operated in cases where the tumour had been for a long time, partially, or almost completely enucleated, and in which there was little bleeding, little discharge of any kind, and little constitutional disturbance.

The anxious practitioner can have, in any case, little hope of benefit from medical treatment pursued with a view to diminish, or produce absorption of, the tumour (not mere diminution of it, such as may result from absorption of œdematous infiltration). Indeed, while it is certain that absorption of a fibrous tumour is extremely rare, there is room for doubting whether such an event ever happens.

Case 7.—I may here mention that I have been, as it were, forced against my judgment, by the evidence of a single very remarkable case, to admit the possibility of the complete removal of a large fibrous tumour by absorption. During its progress the patient took small doses of iodide and bromide of potass almost constantly for years; but extensive experience with these remedies does not lead me to attribute to their use this singular good result. The tumour was as large as the fœtal head at the end of pregnancy. It was as easily and perfectly diagnosed as any case could be. There was no doubt ever thrown upon the nature of the case by any of the experienced practitioners who examined it. It had every character and symptom of a fibrous tumour. The patient was long in the most aggravated state of anæmia. Now, there is as certainly no uterine tumour, as there was certainly one formerly. The only method of escape, for me, from the evidence of this case in favour of complete absorption, is, the supposition that the tumour may have become spontaneously enucleated, separated, and discharged, without the consciousness of the patient. This alternative, I confess, considering the cleanly habits and careful, truthful character of my patient, seems more unlikely than the other. Whatever may be the truth regarding this individual case, every one will admit that it is unreasonable, in the present state of therapeutics, to expect absorption of a fibrous uterine tumour.

There is another termination of a fibrous tumour, worthy of study in connexion with surgical interference, namely its disintegration, decomposition, and expulsion,—a process described with care by Dr. West and others. This is an uncommon ending of a case of this tumour. I have seen more than one example of it, but I believe it to be much rarer than enucleation. I agree with West and M'Clintock in regarding the process as not inflammatory in any stage, so far as the tumour is concerned. It is this termination that Mr. Baker Brown seeks to attain by his gouging operation. As I have already said, I have never practiced this kind of interference, preferring in the meantime to push my efforts in another direction. But I must remark, that this treatment, as illustrated by Mr. Baker Brown's cases, published in the Transactions of the Obstetrical Society of London, demands the studious attention of the practitioner.

Dilatation of the Cervix Uteri.—This is the first operation. It may be resorted to with a view to examine the uterine cavity, and the relations of the tumour.

It may be done by the knife or scissors. This method is applicable only when the tumour, or its lower part, is at or near the os uteri, the cervix being developed as in the end of pregnancy. The scissors is best used without any other instrument. The knife, having its edge blunt or guarded up to near its point, may be used in the same way; or a common straight bistoury may be used through a speculum exposing the cervix, or with the aid of the duck-bill speculum of Marion Sims. The extent of the cutting varies; sometimes one, sometimes two fingers, sometimes even the hand, can be passed through the artificial opening. The wounds so made may heal up, to a great extent at least. Little bleeding follows this operation.

Mr. Jonathan Hutchinson says, without qualification, that the danger of hemorrhage from incision is very slight. But I cannot view the matter so, believing that if, in cases adapted for dilitation by tents, incisions are used, then profuse hemorrhage may occur, an event to be most carefully shunned. Dr. Marion Sims gives a good example of this bleeding in his work on Uterine Surgery (p. 111).

The dilatation is best effected by tents, when the upper part of the cavity of the cervix uteri is not opened up as in the end of pregnancy. Sea-tangle tents are to be preferred, and sometimes they produce all needful opening of the cervix. But when a large amount of dilatation is desired, I have found tangle-tents inefficient, and then, after the tangle-tent, a common conical sponge-tent of suitable size is to be resorted to.

These operations have frequently appeared to me to have for one or for many succeeding periods, a decided effect in abating the amount of the bloody discharge. Speaking of the use of sponge-tents, Mr. Grimsdale remarks,—

"They might, as I had observed in several similar cases before, produce such an altered condition or action of the lining membrane of the cavity as should for a considerable time, probably many months, check the tendency to hemorrhage." Similar opinions as to the beneficial effects of incision of the os and cervix have been published by Baker Brown and M'Clintock.

Before leaving this topic, I have to mention an ingenious suggestion by Marion Sims, which I have found sometimes, in cases of the kind now under consideration, but still more in cases of other descriptions, to be very valuable, especially when the introduction of the first tents (or of a probe) is difficult, or without it impracticable. It consists in fixing or gently pulling one lip of the uterus by a delicate tenaculum hooking the margin of the cervix. It is held by an assistant. Dr. Sims uses his duck-bill speculum in performing the operation. It can be as well done without it. The tenaculum is used without causing pain; indeed, the patient seems unaware of its application.

The following case illustrates the advantage of dilatation of the cervix. It is interesting on account of the cure of the bleeding, and, to the patient's feeling, the removal of the tumour. It is chiefly extracted from my ward case-book.

Case 8.—Mrs. D., aged 48, has been twice married, and had a child ten years ago. She began, three years ago, to suffer from large discharges of blood, per vaginam, which have returned monthly. At the same time she first observed a tumour in the lower belly, and it appeared to her to be as large then as it is now. Latterly, the bloody discharge has been almost constant for some months.

She is excessively anæmic, complains of ringing in the head, palpitation and want of breath. Auscultation discovers an anæmic bruit in the heart and great vessels. There is in the lower belly a rounded hard tumour, rising half way up to the umbilicus and extending from one inguinal ring to the other. The uterine bruit is well heard over it. Per vaginam, the whole brim of pelvis is felt to be occupied by a hard rounded mass, which combined external and internal examination identifies with the tumour in the hypogastrium. A probe introduced shows the uterine cavity to be behind the tumour.

Dr. Duncan, by means of a sponge tent, largely dilated the cervix and lower part of body of uteris, with a view to incising the tumour; but this was found impossible, as, by no manipulation could he reach a proper part of the tumour, a vesicle sound always showing a sort of diverticulum of bladder between his knife and the mass.

Subsequently to these manipulations, and under the use of mineral acids and ergot during the continuance of bloody discharge, of iron and quinine in its absence, she became so greatly improved as to demand her dismissal, after about a month's residence in the hospital. After six months she returned, looking well and robust, but complaining of rheumatism. She said her discharges had ceased and that the tumour was gone. An examination discovered the tumour still present, but apparently so diminished in bu k as to be in the brim of the pelvis, so that it could now be only with difficulty felt by pressing the hand firmly above the pubes. Per vaginam, it was easily found.

It is now two years and a-half since she last came to the hospital; and she promised to return, should any of her disorder again appear.

Incision of the Tumour.—Is resorted to after dilatation of the cervix. This operation appears to me to be useless except where the tumour is still covered by uterine tissue, enucleation not having commenced. It is done by an ordinary sharp-pointed bistoury, guarded by lint or otherwise, except for half an inch at the point; and the duck-bill speculum may be used or not according to circumstances. While the operation is performed, the uterus may be fixed by pressure from above, or by the use of a hook or tenaculum fixed in the cervix uteri. The operation is performed through the dilated cervix uteri. An incision is made of depth and length according to the size of the tumour, and the possibility of safely cutting, without implicating neighbouring parts. I have made incisions which I judged to be an inch in length, and at least half an inch in depth. I have not seen alarming hemorrhage follow the operation.

I believe these incisions generally heal up, to be opened again, in some cases, by ulceration, should enucleation take place. This healing up may lead to obliteration of some of the sinuses, and so to a restraint of hemorrhage, for a time at least. In the case of Miss M. (Case X.) I believe that the incisions made did not heal up, but that the tumour was very quickly propelled against the opening, so as to commence enucleation at once.

I have preferred incision of the tumour to destruction of its covering by caustics, as has been repeatedly practised.

Incision of the uterus and tumour has been often made the first step of the operation of enucleation, which has been proceeded to forthwith or after brief delay. The plan I at present am disposed to prefer, is to make the incision or incisions, and, trusting to their beneficial effects, to wait for a period of months or longer, unless the case is extremely urgent or presents characters peculiarly inviting immediate farther interference.

The operation, like the former, is sometimes followed by diminution of the hemorrhages. I have not seen Dr. Atlee's writings on this subject, and I can only give an extract at second hand from them, showing his plan and opinion, both of which appear, to say the least, to be very imperfectly described. "Dr. Atlee (it is said) has described another procedure by which he says the hemorrhages attendant on these tumours have been 'invariably arrested instantaneously;' and this method is 'during hemorrhage, to pass the bistoury along the vagina into the cavity of the uterus, and make a very free incision into the most exposed portion of the tumour.'" The words, in which the result of the operation is described, are very improperly used, and diminish the value of Dr. Atlee's statement.

The next case illustrates the use of this method of treatment.

Case 9.—A. W., aged 34, had a child when seventeen years of age. During the last twelve months she had been losing, per vaginam, a great deal of blood. For the last six weeks it has come away in very great quantity. She is now very pale and anæmic, and so weak as to be scarcely able to walk without support. She suffers much from bearing down and weakness in the back. Examination, per vaginam, at once shows the presence in the uterus of a small fibrous tumour.

The cervix uteri was dilated by a sponge tent, with a view to the more thorough investigation of, and, if necessary, interference with the tumour. It was found further necessary to cut through the posterior lip of the cervix to obtain access to the tumour. A deep incision, not above an inch in length, was made into the tumour from above downwards.

She left the hospital two months afterwards. There had been, up till that time, no bleeding beyond ordinary menstrual discharge. She believed herself cured, and promised to come back if her floodings returned upon her. She has not been seen again.

Avulsion of the Tumour.—This operation will be easy, in proportion to the amount of the tumour already spontaneously enucleated. Cases are on record in which the operation has been performed without any assistance from nature being waited for. They have been, on the whole, very unfortunate, and my proposals do not imply imitation of this rapid proceeding. It is to this kind of treatment that Baker Brown probably refers, when he says,—"The enucleation of the tumour is an operation so fraught with immediate danger, as well as with the risk subsequently of pyæmia, that I have long since discarded it." The operation of enucleation and avulsion is one frequently carried on spontaneously, and merely completed by art.

In case of probable partial inucleation, there is a question difficult to decide, namely, whether enucleation is really taking place, or whether the tumour is still covered up by a layer of proper uterine tissue. It is important to be able to decide this question, and I know of no simple method of doing it, when roughness of surface and disconnection of lobes do not indicate it. But I have, in the cases here narrated, proceeded upon the following assumption, an assumption which I think further experience will verify. A tumour bulging, but not enucleated, will every where, at its junction with the general body of the uterus, present smooth rounded outlines. But a tumour

partially enucleated will project angularly from the general surface of the uterus.

It appears to me that some advance or propulsion of a partially enucleated tumour will probably form, along with other signs and considerations, such as the size of the tumour, a valuable indication of the feasibility of its removal by avulsion. For unless the tumour is every where surrounded by a comparatively loose layer of fibrous tissue, its movement of advance will be difficult or impossible.

The operation is performed by seizing the tumour with a strong volsella, of which the operator should have more than one pair, so that, when he feels his grasp yielding, he may anew seize the tumour without quite losing hold of it and its slipping back. The tumour is to be dragged; and I have applied all the force which the hold of the instruments would stand in some cases, or which the texture of the tumour would bear without tearing in pieces, in another. I have attached whip-cord to a partially extracted tumour, to aid in the pulling. The pulling should be without jerks, and rapid progress of the operation should not be desired. Sometimes, at the end of the operation, a careful twisting of the tumour may be resorted to, when inversion of the uterus is feared, such twisting making an addition to the separating power without increasing the tendency to inversion.

Sometimes the operation is completed by the curved scissors. Sometimes the fingers are used in its progress to repel the uterine wall, or assist the enucleating process. Sometimes dragging alone completes the operation. In cases of enucleation, authors speak of a pedicle or peduncle, and of dividing it; and I have followed their example. But there is truly no stalk or pedicle, only the remaining attachments of the tumour, which are sometimes drawn out, stalk-like, but only inconsiderably so.

I have not seen hemorrhage follow the operation. The difficulty of completing it, especially in cases of bulky tumours, sometimes lies in the perineum. The perineum and orifice of vagina have to be dilated as in labour. An eminent practitioner has recently informed me that, in a case of this kind, in his hands, laceration of the perineum backwards and through the sphincter ani was produced. Dr. Marion Sims records a case in which he incised the ostium vaginæ to permit the extraction of a tumour of this kind; as also Dupuytren. When the tumour is removed, it often is easy to tell, by the character of its surface, how much has been enucleated in the operation of avulsion, and how much had previously been separated. The last enucleated part presents, as Dr. Hall Davis describes, a perfectly fresh appearance. When washed it is yellowish white, and attached to it may be found shreds of muscular tissue. The older enucleated portions are somewhat shrivelled, reddish brown, cannot be washed white, and have appearances such as are characteristic and would be expected, but can scarcely be described. The differences have some remote analogy to those observed in a case of unavoidable hemorrhage, between the earlier and the most recently detached parts of the placenta.

I now proceed to further illustrations of the practice recommended in this paper. In the following case, incision of the cervix and of the tumour were simultaneously practised. The wound in the uterine wall, investing the tumour, seems not to have healed, for the tumour immediately began to descend. Its progress was at first rapid, and was a very interesting subject of observation. Adhesions appeared to form between the enucleated portion of tumour and the adjacent uterine wall, and were repeatedly broken down, to be found again formed on the next examination. The case is chiefly from the ward case-book. Judging from Dr. Duncan's letter concerning the case, I expect to be able to remove the tumour when she next comes under my care, spontaneous enucleation being now apparently far advanced, and so much as to appear to me to show the possibility of its artificial completion.

Case 10.—J. M., æt. 38, is unmarried, and has had good health till about a year ago. Then her menses began to be irregular, blood being almost constantly discharged. Sometimes, she says, her loss has amounted to a flooding. She has only recently felt a tumour in the lower belly.

Above the pubes a hard mass, as big as the fist, can be felt. Examination per vaginam, discovers the os uteri in its natural situation, and nearly of natural size. The cervix uteri is flattened out or opened up, no projecting portion being found. The whole lower part of the uterus is a large, tuberous, mobile mass. A uterine probe enters the cavity three inches.

Dr. Duncan incised the cervix on either side with a sharp-pointed bistoury. The finger, now easily passed into the uterine cavity, discovers bulging from behind, but not acutely or angularly, a large mass. The lower part of this tumour, opposite the os uteri, was also incised. Little bleeding and no notable suffering was produced by the operation.

Repeated subsequent examinations discovered a gradually increasing descent of the tumour. It projected more and more from the uterine wall, angularly, and descended more and more upon the still expanding cervical portion of the uterus. At the same time it gradually became difficult to feel the mass by pressing the hand over the pubes.

Eight days after the operation, an attack of metritis came on, but was easily subdued.

When she returned home (against my advice), the tumour had so descended that the finger could be passed for at least an inch between it and the posterior uterine wall, while in front lay the uterine cavity.

A little more than a year and a-half after the operation above-described, my friend Dr. J. A. Duncan visited J. M., at her home, and kindly sent me the following report :—"She has had several great losses of blood. The os uteri is much dilated, and the tumour projects through it about half an inch, like a side of an orange. It is much increased in bulk, being felt in the hypogastrium of the size of a child's head."

In the following case, spontaneous enucleation and expulsion into the uterine cavity, of one of a set of fibrous tumours, was nearly completed before the patient came under my care. Although tumours were left in the womb, the improvement of symptoms and diminution of discharge, consequent on the operation described, were very remarkable. An intra-uterine fibrous tumour, with a broad sessile attachment, was removed.

Case 11.—Mrs. R., æt. 54, has had no children. She has, for above fifteen years, been weakened by much suffering in the lower belly and frequent floodings. When the floodings are absent, she has constant copious watery discharge. She has consulted many eminent physicians in the diseases of women, but has obtained no distinct benefit. About five years ago, an eminent London obstetrician told her that he would be satisfied if, five years thereafter, she were alive. For the first two months of this year she had unceasing bloody discharges. She is very weak, but does not appear to be anæmic, judging by her face; her pulse is about 80, and moderately firm.

Two small elongated mucous polypi are hanging from the cervix. The os uteri is slightly patent, and the tip of the finger, pressed into it but not traversing it, reaches something presenting above it. The uterus is very bulky, and with its tumours indistinctly felt through the abdominal wall loaded with fat, occupying a considerable portion of the belly above the pubis, and especially on the left side. A probe enters the uterus three and a-half inches.

Dilatation of the cervix was effected by first using tangle tents, and then a sponge tent as big as the index finger. This operation occupied a day. The tumour was then seized by a strong volsella and pulled down, great force being used. It could not be brought through the cervix without that part being cut through in three places by a probe-pointed bistoury guarded by lint. After it had passed the os uteri, difficulty was again experienced at the os vaginæ, but this was overcome by a few minutes of patient dragging. Its enucleation was completed without any further interference by knife or scissors. It measured two and a-half by two inches, and its examination showed that, during the operation, only its base had been detached from the uterine wall. At this part some long shreds of uterine muscular tissue adhered to it.

The operation was not very painful, and nothing occurred to interrupt her recovery. The mucous polypi were removed by avulsion. Other tumours were left in the uterus, but so high up as scarcely to be in any way reached by the examining finger. After about five weeks, she left Edinburgh, having been for a fortnight at the end of that time without any discharge either bloody or serous.

In the next case, enucleation was little more than well begun when the operation was performed. No previous incision or other operation had induced the commencement of enucleation, which was therefore spontaneous, so far as it had gone, before my seeing the patient. The case is from the ward case-book, and is one of removal of a fibrous tumour, not having a broad sessile attachment, but still almost entirely embedded in the uterine wall.

Case 12.—Mrs. L., æt. 33, married, has had two children, the last four years ago; enjoyed good health till two years ago, when her monthly losses began to be excessive in quantity, and often of long continuance. This state endures, and the loss of blood has been frequently very profuse. She is in a state of great anæmia, very weak, and has much pain in the lower parts of the back and belly.

Dr. Dow of Carnock, who sent the patient to Dr. Duncan, reports that, at one time, a tumour presented at the os uteri, that then the hemorrhage was very copious, and did not lessen till the tumour retreated into the uterine cavity.

Examination, per vaginam, discovers the os uteri patent, admitting the finger. A tumour can be felt, projecting acutely or angularly at its lower margin from the posterior wall of the uterus in which its mass is embedded.

A strong volsella, whose blades were separately applied as in the midwifery forceps, was securely fixed in the lower part of the tumour. Powerful traction was exerted, and simultaneously a slight twisting motion was given to the volsella. The circle of the os uteri, offering an insuperable obstacle to the descent of the mass, was divided by a probe-pointed bistoury. The tumour was now further dragged down into the vagina, and was found to have been deprived of its attachments, except at its base, where some sawing by the finger-nails was required to detach it.

After its removal, which was effected with only an inconsiderable loss of blood, the large rough-walled cavity in the posterior wall of the uterus, from which the tumour had been forcibly torn, was distinctly felt. In the evening preceding the day of operation, two doses of ergot of rye were administered to the patient, and seemed to be the cause of pains in the back during the night.

The tumour is dense, smooth on the surface, and having only one considerable shred of the proper uterine tissue attached to its base. It is oval, measuring 3½ inches in length, and six inches in circumference at its broader and upper end. The part detached before the operation can be easily recognised. It comprises only one-sixth part of the mass.

This woman's next monthly period was moderate in amount, and she left the hospital in improved health.

In the following case, there can be no doubt that, without the operation, life could not have been preserved. The tumour here also was, for the most part, still embedded in the uterine wall when operative interference was resorted to.

Case 13.—Mrs. ——, the mother of a family, above 40 years of age, had, about three years before the events now to be recorded, been under my care. She was suffering very greatly in health from uterine hemorrhages. The uterus was occupied by a considerable fibrous tumour. At this time I dilated the cervix fully with sponge tents, but did not discover anything unusual, or such as to encourage me to interfere further in the case, otherwise than by medicinal treatment. Since this time the history of her floodings has varied much, but in the months preceding the operation to be described it was extremely unfavourable.

Writing to me in January concerning an attack of hemorrhage in this

lady, Dr. Adamson, of St. Andrew's, says:—"The polypus projected into the vagina nearly the length of my forefinger. I got my finger up by its side so as to reach the thin edge of the os uteri, grasping it firmly, and I had to desist from exploring it all round, because it required considerable pressure to get my finger far enough up to feel the os, and the pressure caused great pain of the back, and was attended with strong effort to vomit. From the history of this attack of flooding, which was preceded for some time by regular uterine pains like labour pains, and which suddenly ceased with the occurrence of a gush of blood, it is my belief that the polypus was protruded by regular uterine contractions, and that it had been gradually retracted. You will see her after the next period."

The next period was as full of danger as the former two, and Dr. Adamson was in fear of an immediate fatal result of the hemorrhage. He told me he could not expect her to survive another such loss, and the subsequent history of the case shows that his fears were well founded.

In the end of January she came to Edinburgh. Her anæmic condition was extreme. Examination, per vaginam, revealed the presence of a large uterine tumour. The os uteri admitted the tip of the examining finger, and the tumour could be felt above it. Menstruation commenced soon after her arrival, and the loss was quite inconsiderable. The blood discharged was thin and watery, and it ceased to flow on the 2nd February. At this time she was allowed to get out of bed; she was feeling pretty well, and had no pain. During the period she took in the course of each day thirty grains of gallic acid and a drachm of the liquor of ergot. This last was given with the hope of obtaining the descent of the tumour.

On the 3rd February copious bloody discharges began, and she was at once plunged into the most alarming condition. She had frequent faintings while lying in bed. She suffered no pain resembling that of the uterine contraction, but, on examination, the tumour was now found in the vagina, bulky and fully occupying the passage. It had descended as the renewed discharge commenced, for an examination on the 2nd February showed the os uteri to be in the condition described as existing at the time of her arrival in Edinburgh.

To give time for preparing the operation, and also to allow of some rallying of the vital powers, should the means be successful, a plug of lint wetted with solution of perchloride of iron was inserted. It proved efficient against the bleeding.

Next day the plug was removed, and the operation proceeded with under the most unfavourable circumstances, the patient being almost pulseless at the wrist. Dr. Graham Weir assisted me.

The plug was removed, the tumour seized by volsellæ and dragged. After many efforts and much laceration of the tumour, it appeared to us almost hopless to proceed. The os uteri could with the greatest difficulty be reached by the finger, and the uterus was partially inverted. It was impossible to say certainly where the tumour ended and uterine wall began; yet some indications could be made out, and at these places the fingers were used to aid in separating the tumour and in pushing back the uterine wall. At last, after laborious perseverance, the mass came away. The hole from which it was excavated was in the anterior wall of the uterus, and presented a very ragged surface. Very little blood was lost in the operation, and no plug was used after its completion.

This patient made a slow but uninterrupted recovery. A copious purulent discharge flowed for nearly six weeks. This I attribute to vaginitis caused by the plugging. She never again has had uterine hemorrhage. Fifteen months after the operation she had a miscarriage.

The tumour measured 5 inches by 3. It was not very dense in its structure, having numerous lobules. Several shreds of muscular uterine tissue were attached to it. On the surface of the tumour, and between the lobules, large and freely communicating venous vessels were seen. The largest were about one-sixth of an inch in diameter, contained clots, and opened on the presenting part of the tumour. It was easy to make out that somewhat more

than a half of the mass had been separated from its uterine nidus in the operation.

The following case presented such extreme urgency, that I operated without having any reason to believe that enucleation had commenced, and the examination of the tumours after separation showed that they had not been denuded at all. I find it difficult to account for their successful removal, and prefer giving little account of it. It is, however, almost certain that the volsella had got fixed in the tumour, and had at the same time lacerated an opening in the uterine wall for its transmission, and pulled it through.

Case 14.—J. C., aged 45, unmarried, has for fifteen years been very anæmic, and constantly seeking relief from eminent obstetricians in various places for menorrhagia and dysmenorrhœa. She has been several years under my care for the same maladies, and the advantage gained by medical treatment has been certainly very slight. About twenty minutes before the operation now to be described, and again two years before that time, I made attempts to relieve her by surgical interference. On the first occasion, I incised the tumour, having previously dilated the cervix to reach it as it lay in the anterior uterine wall. This was followed by diminished monthly losses, and consequent improved health for several months. On the second occasion, twenty months before the operation now to be described, I attempted and failed to do what I subsequently succeeded in effecting.

I was driven to the operation by the most urgent considerations. Her life was a burden, and she desired relief at whatever risk. Twice her life had been for many days despared of, and she was living almost entirely in bed, when I resolved to try a third time.

The description of her anæmic condition at this time cannot be exaggerated. Her pulse was scarcely to be felt, and was quick. Her tongue and fauces were as pallid as her skin. She had no appetite, and subsided on the smallest possible amount of liquid food. Anasarca of the whole body was present, and though lying in bed her lower limbs were as swellen by a pretty dense œdema as they are seen to be under any circumstances. She had considerable hydrothorax of both sides, and great fits of breathlessness, with orthopnœa, which looked like impending dissolution.

Assisted by Dr. Linton, I proceeded as I shall now describe, premising that, in consequence of the hardness and length of the perineum, every step of the operation was very difficult. In addition, she was so fat that the size and relations of the tumour could not even be guessed at with any exactness. I had previously dilated the undeveloped cervix and cavity of the uterus with tangle tents, but nothing like a tumour or projection, only a slight bulging elevation, could be felt in the anterior wall of the uterus, in which other means of examination showed the lower part of a tumour to be. Into the lower part of this elevation I fixed a volsella, and as it slipped, I seized and pulled by another, or by a hook. The violence used was great, as much as the tissues would bear. As I did not see that any other proceeding was available, we continued laboriously pulling with all the force we could apply. The volsellæ were moved to new and higher holds as a mass descended; and finally, a clean enucleated fibrous tumour came away. It measured 2 inches by 1¼. It was probably only a lobe of a mass larger than itself. I therefore renewed the operation. But the next mass began to tear, and we felt that the root, not thicker than a finger, and having its attachment high in the uterus, would soon be entirely severed. I divided it with scissors, getting away a fibrous mass measuring 1¼ by 1 inch. Very little blood was lost, and the operation was finished. The examination of the tumours discovered no indication of their having been even partially denuded before the operation.

The operation was painful, but she did not seem to suffer after it, and gradually improved in health. In a few weeks she began to get up. and to go about her house. Since this time—fifteen months ago—she has never been confined to bed for a day. The monthly periods are regular and moderate. She has almost always a slight watery discharge, tinged often with blood.—*Edinburgh Medical Journal, Jan. and Feb.* 1867, *pp.* 628, 706.

90.—OVARIOTOMY: PEDICLE SECURED BY SILVER WIRE AFTER THE FAILURE OF THE ACTUAL CAUTERY TO ARREST HEMORRHAGE.

By Dr. J. Marion Sims, Knight of the Legion of Honour; Physician to the Women's Hospital, New York, &c.

[The patient was an American lady, 52 years of age. She had a multilocular ovarian cyst, probably without adhesions.]

An incision, three inches long, was made in the usual way through the abdominal walls, and the cyst was exposed. The trocar was introduced, and emptied one of its largest compartments of about ten pounds of a dark brown serous fluid. Five other compartments of the cyst were in turn punctured; but in two of them the fluid was too thick to flow through the tube of the trocar. The other three gave vent to about twenty pounds more of fluid. To expedite the operation, the external incision was enlarged to the extent of five inches, which allowed me to extract the remainder of the tumour *en masse*. It was attached to the right broad ligament. The pedicle was short and broad. When spread out in the clamp, it measured four and a half in width. Its veins were large and tortuous. It was severed by the actual cautery, according to the plan of Mr. Baker Brown.

On removing the clamp, blood began to ooze from the end of the line of cauterization farthest from the fundus uteri. The bleeding seemed to be chiefly from the open mouths of the large veins. An inch of tissue including the veins was encircled in a loop of silver wire, which was drawn tightly, twisted firmly, and cut off close to the twist. The mere mechanical manipulation of doing this unfortunately tore open the whole extent of the line of cauterisation, and blood oozed out from every part of it. To secure this long line (nearly four inches) of bleeding surface, it was necessary to introduce five other loops of silver wire, embracing as many segments of the bleeding pedicle, each of which was twisted separately and cut off close, as before described. The uterine artery spouted furiously, and required a special ligature. After the bleeding was wholly controlled, the pelvic and abdominal cavities were thoroughly cleared of the fluid that unavoidably escaped into them, and the external incision was closed by a continuous suture of silver wire. The whole of the peritoneal membrane, whether lining the walls of the abdomen or investing the intestines, was deeply congested, and had a red granular appearance. The tumour had no adhesions; and, notwithstanding the appearance of the peritoneum, there was no unusual amount of serum in its cavity. She was fully under the influence of ether only during the early period of the operation, and recovered easily from its immediate effects. Reaction was established in two hours with a pulse at 108, which at midnight fell to 96. She vomited only twice during the afternoon, and was wholly free from pain or suffering of any kind.

About two hours after the operation, the urine (fourteen ounces) was drawn off by the catheter; but after this she passed urine spontaneously and freely. The bowels were moved spontaneously on the third day. She slept every night without anodynes; and took nourishment with a relish from the first day.

There was nothing whatever worthy of remark during the convalescence. The external wound healed perfectly by the first intention. The silver sutures were removed on the tenth day after the operation. She sat up and walked across the room on the eleventh day, and on the twenty-second day she returned to her house in Paris perfectly well.

The solid part of the tumour removed *en masse* weighed eleven pounds, and the fluid thirty-two pounds. Dr. Johnston and others present estimated the loss of fluid during the operation at eight or ten pounds. The whole amount was probably near fifty pounds.

In one of the cysts the fluid was straw-coloured, in another coffee-coloured, in one it was dark as sugar-house molasses; in others it was of the consistence of jelly.

The operation of removing the tumour lasted twenty minutes, and the time taken in securing the pedicle was about twenty minutes more.

Ever since the first introduction of the use of silver sutures in 1849, I have advocated the application of the metallic ligatures to the pedicle in ovariotomy. In 1858, this view was held forth in my paper, "On Silver Sutures in Surgery." Since then, I have carried it out in practice.

Dr. Nélaton performed the operation of ovariotomy in Paris in May, 1864, on a patient of Sir Joseph Olliffe, and kindly allowed me to secure the pedicle with silver wire. It was transfixed by a double wire, which was cut in two, and each half was twisted tightly on opposite sides of the pedicle. This was then cut off near the ligatures and returned into the cavity of the abdomen, and the external wound was closed by silver sutures. Unfortunately for the poor patient, she died on the fifth day after the operation, of blood-poisoning from the peritoneal exudation. But fortunately for science, a *post-mortem* examination showed the metallic ligatures entirely embedded in the tissue of the pedicle, and so perfectly sacculated that I was obliged to cut into its structure to find them.

The wire had cut into the tissue, and this had healed behind its track, and thus it was wholly covered up and hidden from view. I was able to foretell what would be its method of action by observation from analogy. In 1850, by means of a silver wire, I made the effort to strangulate a warty excrescence on the cheek of a lady sixty years old. It was of about the size of the end of the little finger, and projected as least half an inch above the surface. It was hard to the touch, and of a reddish tint. On tightening the wire at its base, the top became of a deep purple colour, showing that its circulation was momentarily arrested. On visiting my patient the next day, I was surprised to find the excrescence of its original colour, without the least sign of a disorganising process. On the contrary, its circulation was going on as vigorously as before the application of the wire. On a minute examination, I found that the wire had cut a bed for itself entirely around the structure embraced, and that the tissue so cut had overlapped the wire and healed over it, thus encasing or sacculating it completely, and this within the short space of twenty hours. Of course it was a mistake to apply the wire at all with the idea of producing a slough, and it was clipped and drawn out.

Notwithstanding this lesson, I made the mistake again of applying a silver wire to hemorrhoidal tumour with the expectation of strangulating it. The strangulation was only momentary; for, two days after the operation, I found the hemorrhoid presenting almost the identical appearance that it did before the operation, while the wire was partially embedded in its structure and securely held there by cicatrising process such as that described in the case above. The experience gained by these two experiments gave me the idea of applying the wire to the pedicle in ovariotomy, and of explaining its probable action; while the fact observed in the case of M. Nélaton and Sir Joseph Olliffe demonstrated the truth of what was so naturally inferred.

It was a great improvement in the operation of ovariotomy when, a short time ago the pedicle was drawn out and secured by a clamp externally to the abdomen instead of being tied with a cord, as formerly, which was then allowed to hang from the lower end of the external wound, thus acting the part of a seton and exciting the action which it should have been our object to prevent. But I think a still greater advance is made, when we can secure the bleeding pedicle in such a way as safely to replace it within the abdominal cavity, and thus allow the external wound to be healed throughout its entire length by the first intention.

For this desirable end we now have two methods; the one of treating the pedicle by the actual cautery, so successfully practised by Mr. Baker Brown; the other by means of the metallic ligature.

The actual cautery does not always succeed; and the case above described clearly proves that we have a safe and sure resource in the silver ligature.

At a recent discussion at the Obstetrical Society in London, the fact was elicited that the actual cautery failed to arrest the hemorrhage in one-fourth of the cases operated upon by this method by Mr. Harper. It is well to know this, and to be prepared for such a contingency.

In Mr. Baker Brown's last thirty-nine operations he has used the actual cautery, and has lost but five cases.

I am well satisfied that the actual cautery and the metallic ligature are at present our safest means of securing the pedicle in ovariotomy.

No surgeon can expect to perform this operation successfully who is in the constant habit of making dissections or *post-mortem* examinations, or of dressing erysipelatous or other poisonous wounds. And it is quite as essential that each of his assistants, even the meanest sponge-washer, should be as clear of all contaminating influences. Mr. Spencer Wells, M. Maisonneuve, and others, having observed that many deaths after this operation are due to blood-poisoning, as a consequence of a sero-sanguineous exudation into the cavity of the peritoneum. When this is the case, the proper course is to puncture the peritoneal cavity through the posterior vaginal *cul-de-sac*, evacuate its contents, and keep it drained and even washed out. This idea and operation are due to my distinguished countryman, Dr. Peaslee; and I believe it has been carried into practice also by Mr. Spencer Wells.—*British Medical Journal, Jan.* 19, 1867, *p.* 50.

91.—SEVEN CASES OF OVARIOTOMY, IN WHICH THE PEDICLE WAS LIGATURED IN TWO PORTIONS AND DROPPED BACK INTO THE ABDOMEN, THE ENDS OF THE LIGATURES HAVING BEEN CUT OFF.

Under the care of THOMAS BRYANT, Esq., Assistant Surgeon to Guy's Hospital.

During the last two years Mr. Bryant has had many cases of ovariotomy, and in the majority he has adopted the practice of ligaturing the pedicle, cutting off the ends of the ligatures, and dropping the whole into the abdomen. The following cases are the last series he has had at the above hospital, and the success which has attended the practice is somewhat satisfactory, one case in seven only having proved fatal.

Case 1.—*Polycystic ovarian tumour; ovariotomy; fatal result.*—Ann B., aged 25, admitted on November 21st, 1864, under the care of Dr. Hicks and Mr. Bryant. She was a married woman, the mother of four children, and had had good health till one year previously, when she first observed her abdomen to enlarge, and from that time the increase had been rapid. On admission a polycystic ovarian tumour was diagnosed. She was tapped, and twelve pints of fluid drawn off. She convalesced, and left for the country; but she returned in two weeks as large as ever. Ovariotomy was then proposed, and on Jan. 10th it was performed. A moderate incision was made, and the tumour drawn out, no adhesions existing. The pedicle was long, and ligatured in two parts, the whole being dropped in, and the wound closed. A quarter of a grain of morphia was then subcutaneously injected. Peritontisis subsequently set in, and the patient died on the eighth day.

Case 2.—*Polycystic ovarian tumour; ovariotomy; recovery.*—Mary L., aged 43, a stout and healthy woman, was admitted, under Mr. Bryant's care, on December 14th, 1864. She was married and had nine children, the youngest being six years old. Nine years previously she accidentally discovered a swelling on the right side of the abdomen; it was painless, and caused her little distress; its growth was gradual, but since her last confinement, six years ago, had increased more rapidly. When admitted, her health was good. Her abdomen was very large and tense, measuring forty-nine inches in circumference. A single ovarian cyst was made out. Ovariotomy was performed on Jan. 25th, Drs. Oldham and Hicks assisting. The

abdominal incision was about four inches in length. There was no parietal adhesions. The cyst was readily extracted, and the pedicle ligatured in two portions and dropped in. A long and firm pelvic adhesion as large as the pedicle was then treated in the same way, and the wound closed. No bad symptoms followed, and the patient rapidly convalesced.

Case 3.—*Multilocular ovarian tumour; ovariotomy; rapid recovery.*—M. L., aged 17, was admitted, under Dr. Oldham and Mr. Bryant's care, on April 20th, 1865, having been sent up by Dr. Corbett, of Kingston-on-Thames, for operation. She was single, and had always been healthy until two years ago, when she first observed her abdomen to enlarge. In September she was tapped at St. Thomas Hospital, when twenty-four pints of a dark-coloured fluid were drawn off. In two months she began to refill. On admission into Guy's, the abdomen measured forty-one inches in circumference; it was very tense. On May 20th ovariotomy was performed, a long incision being made. Extensive parietal adhesions existed, which were readily broken down with the exception of two, which, with one large omental adhesion, were ligatured and divided, the ligatures being cut off. The pedicle, which was a short one, was ligatured in two portions and dropped in. The wound was closed with silk sutures. Everything went on well after the operation, and rapid convalescence was established.

Case 4.—*Monocystic proliferous ovarian cyst; ovariotomy; recovery.*—Sarah P., aged 25, was admitted on Oct. 21st, 1865, under the care of Dr. Oldham and Mr. Bryant. She had observed her abdomen to enlarge for three years, but its increase had been slow. She became pregnant, and was confined two years since; and after that period the growth of the disease was more rapid, its increase being attended with pain. On Nov. 1st ovariotomy was performed. A small abdominal incision was made, and the cyst was readily withdrawn, no adhesions existing. The pedicle was ligatured in two portions and dropped in. The wound was closed with silk sutures, and a suppository of opium given. Recovery went on rapidly after the operation, and in one month she left well.

Case 5.—*Proliferous ovarian cyst; ovariotomy; rapid recovery.*—Mary A. B., aged 27, a married woman, the mother of four children, was admitted on Dec. 10th, 1865, under the joint care of Dr. Oldham and Mr. Bryant. After her second confinement, four years ago, she observed her abdomen to be large. She then consulted Dr. Oldham, who discovered an ovarian cyst, for which she was tapped, a pailful of clear fluid being drawn off. Twelve months ago, after her fourth confinement, the cyst began again to fill, and since that time it has rapidly increased. She is a thin, pale woman, and her abdomen is much distended. Ovariotomy was performed on Jan. 3rd, 1866. A moderate incision was made. A few parietal adhesions existed, which were readily torn through. Omental adhesions also existed. The tumour was extracted, and the pedicle ligatured in two portions and dropped in. The wound was closed by deep and superficial silk sutures, and a suppository administered. On Jan. 7th the stitches were removed, the wound having healed; and on Feb. 1st the patient left well.

Case 6.—*Polysystic ovarian tumour; ovariotomy; rapid recovery.*—Margaret C., aged 22, was admitted, under the care of Dr. Oldham and Mr. Bryant, on April 20th, 1866, having been sent in by Mr. Francis Toulmin, of Hackney, for operation. The patient was a single woman, and had always had good health. She had observed her abdomen to enlarge for three months. On March 21st she was seen by Dr. Oldham, who suggested tapping, when seven pints of a thick fluid were drawn off. She rapidly refilled. When admitted she was larger than ever, and measured thirty-six inches in circumference. On May 16th ovariotomy was performed, a moderate incision being made. Some parietal adhesions existed, and were torn through. The tumour was readily removed, and the pedicle ligatured in two portions, the ends of the ligatures being cut off, and the whole dropped in. The wound was closed with silk sutures. Rapid recovery followed the operation.

7.—*Monocystic proliferous cyst; ovariotomy; rapid recovery.*—Harriet

B., aged 19, a single woman, was admitted, under the joint care of Dr. Oldham and Mr. Bryant, on Nov. 29th, 1866, with ovarian dropsy. She had observed the tumour for about nine months; her catamenia having been irregular and profuse for that time, and much pain having existed in her right groin. Her abdomen had steadily increased in size. On Dec. 12th, 1866, ovariotomy was performed. A moderate incision was made. No adhesions existed. The cyst was readily drawn out, and its pedicle ligatured in two portions. The wound was then closed and secured by silk sutures, the peritoneum having been touched only by the scalpel. No single bad symptom followed. On the fourth day the sutures were removed, rapid recovery having taken place.—*Lancet, Jan.* 19, 1867, *p.* 80.

ADDENDA.

95.—ON THE REMEDIAL USES OF THE PRUNUS VIRGINIANA.

By Dr. Clifford Allbutt, Physician to the Leeds General Infirmary.

[The Prunus Virginiana, or American Wild Cherry, has a special power of giving tone and calmness to the arterial system. The rapidity and intensity of the heart's action are lessened.]

I have found the wild cherry useful, not only in cases of cardiac disturbance, but also of general nervous excitability, of "atonic" dyspepsia, and of intestinal irritability. It seems, however, to have a more special bearing upon the arterial nervo-muscular tissues, as digitalis also has, and in proper cases it comes as a valuable substitute for digitalis when this medicine is ill-borne. Many sedatives, as you are aware, tend to cause nausea or vomiting in those who take them, as do, for example, opium, chloroform, tobacco, and many others. Digitalis in its degree shares with them that peculiarity; and you will find in practice many persons who cannot bear digitalis, even in small doses, on account of the nausea which it causes in them. We may often avoid this ill effect by judicious exhibition and combination, but sometimes no care can prevent it. In such constitutions or states of disease the wild cherry is of great value. In doses under half a drachm of the tincture, and under one ounce of the infusion, it is, so far as I can tell, invariably well borne. On the other hand, it is not equal to digitalis in the special relief which we need in extreme cases. It is, indeed, rather to be used in the continuous treatment which follows the removal of the worst symptoms. The wild cherry is not an heroic remedy, and yet it is not an insignificant one. Moreover, it is a perfectly safe one. I have never seen a case among the many which I have treated where the infusion or tincture of the wild cherry has been followed by any poisonous consequences. On the contrary, I seldom prescribe it in suitable cases without receiving a spontaneous tribute from my patient to the success of the medicine. In doses larger than those I have mentioned, however, I have found that the valuable properties of the drug were not obtained, and, indeed, that in more than one instance increased distress, and sometimes even sickness, seemed to result from the use of it. When doses beginning at fifteen or twenty drops of the tincture and half an ounce of the cold infusion do not make some change for the better, I now lay aside the medicine till a more convenient season. Medicines, like mortals, are not at all hours infallible.

[It is in mitral regurgitation, perhaps, that the wild cherry is the most valuable Here, a slight mal-adaptation may cause most painful disturbance. Steel is not often admissible in any stage of this disease.]

Miss E. W., aged 27, subject to palpitation on exertion for eighteen months, also to cardiac oppression, spasmodic dyspnœa, occasional dim vision and fainting sensations; slight cough of some weeks' standing; occasional pain and puffiness about the ankles towards evening; bowels irregular; urine often scanty and high-coloured; has spit a little blood once or twice. Consulted me last August on increase of these sufferings. I found mitral regurgitation; her complexion was dusky, her lips bluish, her pulse small and irregular. Her father died, about the age of 45, of heart disease.

Ordered salines and diaphoretics to relieve congestion; bowels kept free. R. Tinct. pruni virginianæ ℥ xx.—xxx. five or six times a-day, as required. The next day but one, on seeing her, she expressed to me much gratitude for the "drops" which gave her marked relief. After omitting the other medicines, the drops were continued, and she improved daily. The heart became much more quiet, the pulse more certain and full, the cough disappeared, and she became able to go up and down stairs without any great dyspnœa. R. Pot. iodid. gr. iv.; sp. æth. nit., tinct. aurant., āā℥ ℈ ss.; inf. pruni virginianæ ℥vij. Three times a day. From this time her improvement became rapid, and in seven weeks from the beginning she undertook a somewhat fatiguing journey with my consent.

The next case is from my out-patient list at the Hospital. J. G., aged 45, mill-hand, complains of cough, occasional blood-spitting, and of wearing pain in left arm; also of palpitation, dyspnœa, and occasional slight anasarca. There is decided, but not unmanageable, venous congestion of the viscera, &c., a poor and irregular pulse, and a "mitral regurgitant murmur." R. Infus. pruni virgin. ℥ j., three times a day. The week following, the patient paid a spontaneous tribute to the power of the medicine, and in six weeks had regained considerable ease.

I might tell you of twenty such cases. In nearly all, the patients were left to give their own opinion, and, in addition to ease at the heart, they often expressed much pleasure at the restoration of appetite. Loss of appetite, probably due to congestion of the capillaries of the stomach, and consequent suppression of gastric secretion, is a frequent symptom of heart disease affecting the venous flow.

I shall add some observations on the value of prunus virginiana in a few other diseases. In *chronic bronchitis*, depending upon or accompanied by valvular disease or dilatation of the chambers of the heart, I have found it of great service. Such cases are, you know, but too common. In them I always found my best remedy in digitalis; I now find the prunus virginiana do nearly as well—I have often thought quite as well—in calming the cough and so-called asthma, and it is infinitely preferable in that it also improves the appetite and strength, and may be given continuously and fearlessly. These patients are among the crosses of the hospital physician; incurable, but capable of passing relief, they hang on winter after winter, gasping forth their tale of inevitable sorrows.

One of these unhappy old fellows, whose daily food was gin and sulphuric ether, and every one of whose weeks was to have been his last for a month, pleaded so hard for some medicine of supernatural virtues, that, from whim rather than calculation, I ordered him twenty drops of tincture of wild cherry every two or three hours. The old gentleman did not appear for a fortnight; then he appeared, as usual, and I had resigned myself to the invariable beginning—"Eh, sir, I thought last week I should have"—when, to my amazement, he concluded—"recovered altogether. Them drops made me over again, and I thought I shouldn't 'a come no more, but they only lasted me ten days, and now I'm as bad as ever." It is needless to say that he was supplied with an infinite series of drops, and every week he invented some new form of panegyric upon their virtues. He has long withdrawn his injurious opinions of the science of medicine, and of my skill in particular: he has magnanimously overlooked the illimitable iniquity of the Poor Law guardians, and at last he informed me he was about to begin life afresh as a retail dealer in oranges. In all seriousness, I believe that any one who gives the tincture of prunus virginiana in these forms of bronchitis will not be disappointed. Bronchitis, depending upon scrofulous, gouty, or any such affection of the mucous membrane of the lung, has nothing in common with the former disease except coughing and spitting, and these cases have their own remedies. I have not found the wild cherry infusion of much service in the dyspepsia of phthisis—that is, of no more service than any other vegetable bitter. It is valuable, however, in these and all other cases where much nervous susceptibility is present with vascular irritability. Generally speaking, I use the infusion when I want the so-called "tonic and stomachic"

effects of the medicine, and the tincture when I want more especially to relieve distress in the chest. I think the distinction is worth noting.

In conclusion, I may say that in many cases of the kind remediable by prunus virginiana I have tried other vegetable bitters with hydrocyanic acid added. I have not found this imitation to answer, and I believe, therefore, that the good effects of the drug depend upon something more than the prussic acid it contains. I shall refer those who wish to gain some knowledge of the botanical and chemical characters of the prunus virginiana to the excellent description by Professor Bentley, published by him in the new series of the *Pharmaceutical Journal*, at page 97 of Volume V. My sincere thanks are also due to Mr. Reynolds (of the firm of Harvey and Reynolds, 13, Briggate, Leeds), for his extremely valuable aid in this, as in all instances where I have investigated the properties of drugs. I am sure he will gladly answer any questions concerning the prunus virginiana and its preparations.—*Medical Times and Gazette, Feb.* 16 *and March* 2, 1867, *pp.* 161, 217.

96.—ON THE PHYSIOLOGICAL AND THERAPEUTICAL ACTION OF NARCEIA.

By Dr. A. Eulenburg.

Dr. Eulenburg employed in his experiments the hydrochlorate of narceia in the dose of one-sixth to one-half a grain when administered internally, but in that of one-eighth to one-fourth of a grain when used in hypodermic injection, in which form of application the successful results of the treatment were well observed. He never saw any unfavourable symptoms after these doses, such as headache or gastric effects, which usually follow the use of morphia when given in corresponding doses. Among the physiological effects of the operation of narceia, the most striking and most constant is the diminution of the frequency of the pulse, with a corresponding weakening of the flow of blood, and sometimes a subsequent slight acceleration of the pulsations. The respirations were sometimes temporarily retarded, and occasionally they were rather accelerated, but generally no effect was observed on the temperature of the skin. On the extremities of the sensitive nerves in the skin, narceia acts in an analogous manner to other narcotics; but Dr. Eulenburg could discover no effect upon the urinary organs. As to its therapeutical effects, he employed it with good results as a sedative and hypnotic in the most varied diseases where local irritation, attended with great pain or general excitement, required the use of narcotics. Its operation was also favorable in certain cases of peripheric neuralgia, and in one case of hysterical convulsions with spastic contractions, in which form of disease morphia is of very little use. Narceia is, therefore, a very valuable remedy in all those cases in which morphia is either not tolerated from the beginning, or in which it has lost its effects from long use.—*Schmidt's Jahrbücher.—British and Foreign Medico-Chirurgical Review, April* 1867, *p.* 525.

Narceine is coming into great fashion amongst the French to replace morphia. The dose, generally given internally, is from a sixth to half a grain. At the outset it diminishes the pulse, but subsequently accelerates the pulsations. It does not seem to produce constipation, but rather a free action of the bowels. It is said to retard menstruation. Dr. Eulenberg prefers it to any other narcotic, and gives it in neuralgia, in painful affections generally, and articular diseases, iritis, cystitis, and orchitis, stating that it produces sleep, "which is soft, tranquil, uninterrupted, and followed by a quiet awaking." Narceine is reported to be preferable to morphia as a general rule, and to act effectually in those cases in which morphia fails.—*Lancet, Feb.* 16, 1857, *p.* 220.

97.—ON THE THERAPEUTICAL PROPERTIES OF NARCEIN.

By Dr. Oettinger.

Dr. Oettinger performed sixteen experiments with solution of narcein on healthy persons, the drug being injected beneath the skin, and in some cases administered internally, at the same time, in the dose of half a grain to one grain and a half. All the experiments showed that the injected solution caused severe burning pain, and an inflammatory swelling remained for a long time after, passing into suppuration. The experiments also showed that narcein acts by hypodermic injection as a sedative and anæsthetic, but not so certainly or in the same degree as morphia or atropia. Dr. Oettinger has also had the opportunity of observing the therapeutical effects of narcein in six cases. They were cases of neuralgic pain in the hip, angina pectoris dependent on arterial ossification and emphysema of the lungs, cancer of the pylorus, persistent cough from broken rib, emphysema of the lungs with hypertrophy of the heart, and bronchial catarrh. In the first case the narcein was injected beneath the skin, and it produced severe burning pain in the spot where the injection was applied; but it allayed the neuralgic pain. In the other cases the narcein was given internally, and the results were sometimes, but not invariably, favorable. Dr. Oettinger has arrived at the conclusion, from the results of his observations, that narcein acts almost as a pure hypnotic, without causing any previous excitement. The phenomena it especially induces are, muscular weakness, sleepiness, and in a slight degree, obtuseness of sensation; and also, in small doses insufficient to cause narcotism, it causes retardation of the pulse. As to its internal use, Dr. Oettinger thinks that narcein, which in his experience is at least four times weaker than morphia, ought to be specially recommended in those cases where it is desirable only to cause sleep, and not to allay pain. In cases where opium and morphia, on account of their action on the stomach, and on account of the stimulant properties of the former and the narcotic powers of the latter, are unsuitable, or the hypnotic property of morphia is exhausted, then late in the evening half a grain of narcein may be ordered, either in powder or solution; and next evening, if the hypnotic action has been too weak, and no irritation of the stomach has been manifested, a grain may be given. In fractional doses, as the eighth to the fourth of a grain, it may be used as a sedative in violent cough. As to its hypodermic use, Dr. Oettinger thinks it is unsuitable, because there is no combination of it which is readily soluble in warm water, and thus easy of introduction into the system by *one* injection: and the solutions at present used cause great pain and irritation,—*Schmidt's Jahrbücher.—British and Foreign Medico-Chirurgical Review, April* 1867, *p.* 527.

98.—ON THE ANTISEPTIC PROPERTIES OF THE HYPOSULPHITES.

Dr. Constantin Paul, who has previously written upon the physiological and therapeutical properties of the sulphites and hyposulphites, contributes to the *Bulletin de Thérapeutique* two facts relative to the disinfectant properties of the hyposulphites.

First fact:—A patient suffering from severe dysentery arrived in Paris in October, 1865, during the prevalence of cholera. He inhabited a healthy locality, in which there had been no cholera. Some days after his arrival, the chambermaid took cholera and died in twelve days; after her, several other servants were seized with cholera, but none died. Believing that this outbreak was due to the extremely offensive evacuations of his dysenteric patient. Dr. Paul employed a solution of hyposulphite of soda as a disinfectant. To the great comfort of those in attendance, the fetid odour from that moment disappeared. Not content with this amelioration, however, Dr. Paul

sought to disinfect the offending matter before it left the intestine, for which purpose he employed the solution in the form of enemata. The effect of this was not only to destroy the odour of the evacuations, but also to give considerable relief to the patient, the intestine becoming less painful and defæcation less irksome.

Second fact:—Dr. Paul considering that the lochiæ may be a fruitful cause of puerperal diseases, resolved to try the disinfectant action of hyposulphite of soda as a preventive of these distressing obstetric sequelæ. For this purpose, he sprinkled the napkins to be applied to the parts with solution of the hyposulphite, and found that by that means the disagreeable odour which attends the accouchement-chamber was completely dispelled; and he believes that not only a disagreeable but a dangerous condition of the atmosphere of the apartment may thus be obviated. Dr. Paul states, that far from causing irritation of the parts the solution has rather anæsthetic properties, and, moreover, that wounds previously dressed with it become less sensitive and less painful when touched.—*Edinburg Medical Journal, Jan.* 1867, *p.* 666.

99.—TINCTURE OF PODOPHYLLIN.

By Frdk. W. Dunnr, Sen., Esq., Dulwich-road.

[The following is a good formula.]

Podophyllum, one grain; spirits of wine, two drachms. Dissolve, and add tincture of hyoscyamus, two drachms. Dose: one drachm of the tincture, containing a quarter of a grain of podophyllin, half a drachm of hyoscyamus. This preparation we found sufficiently active, in addition to a black draught when a stronger aperient is required.—*Lancet, March* 2, 1867, *p.* 291.

100.—SYRUP OF THE PHOSPHATES OF IRON, QUININE, AND STRYCHNIA.

From Dr. Lyons' Clinique, at the Richmond, Whitworth, and Hardwicke Hospitals, Dublin.

This very excellent and therapeutic agent continues to be a favourite remedy in the hands of Dr. Lyons, who reports the most important results of its use on a large scale in private practice. It is applicable to the treatment of a large variety of affections in the child and the adult, the male and the female. It promotes appetite, facilitates digestion, improves the tone of the nervous, vascular, and muscular systems, and may hence be employed with good effect in the debilitated strumous habit in the child, the anæmic and chlorotic states in the female, the low conditions of the debilitated frame and broken-down constitution in the adult male, and as an invigorator of cardiac action in those of leuco-phlegmatic temperament, and in cases in which fatty change has commenced to manifest itself in the heart's muscle, after the meridian of life. Dr. Lyon states that he knows of no combination comparable to it. As prepared by his directions, it contains per drachm one grain each of the phosphate of iron and quinine, and one thirty-second of a grain of the phosphate of strychnia. It may be given in drachm doses to the child of five years old, twice or thrice daily, and commencing with this dose for the adult it may be gradually increased to twice or thrice the quantity named.—*Medical Press and Circular, Dec.* 19, 1866, *p.* 619.

101.—CHLORATE OF QUINIA.

From Dr. Lyons' Clinique.

Further experience of this valuable agent (the introduction of which is due to Dr. Lyons, it will be remembered, and which was first made known to the

profession in our pages) has confirmed the views entertained by its inventor. In all the graver forms of typhus, typhoid, scarlatina, small-pox, low phlegmonous inflammations, &c., &c., it has been employed with results of a highly satisfactory character, both in hospital and private cases. It appears to exercise a marked influence in controlling the circulation, sustaining its force, while its rate is diminished. In a case of low typhus with extremely feeble heart and a pulse at 144, the exhibition of a ten-grain dose brought the pulse down from twelve to fifteen beats within an hour after its administration. A case of severe small-pox was treated with it from the outset, in which the pulse never ran above ninety. It is usually administered by Dr. Lyons in a dose from three to five grains, dissolved by the aid of a like number of drops of perchloric acid.—*Medical Press and Circular, Dec.* 19, 1866, *p.* 618.

102.—ON PARAFFO-STEARINE: A SUBSTITUTE FOR STARCH, PLASTER OF PARIS, AND SUCH LIKE SUBSTANCES, IN BANDAGES AND SPLINTS.

By James Startin, Esq., Senior Surgeon to the Hospital for Diseases of the Skin, &c.

For a few months past I have been using what appears to me to be an inexpensive, useful, cleanly, elegant, and efficient desideratum, in the treatment of varicose veins and diseased joints, instead of strapping, and also in all maladies or injuries where rest, equable support, and solidity of the parts affected, are required. This consists in immersing "Domett flannel," "Welsh flannel gauze," the woven elastic or other bandage, or felt, either the common carpet felt or that prepared for surgical purposes, in a combination of equal parts of rock paraffine and stearine, as used for candles, which may be coloured to a flesh-tint with alkanet root, and liquified to a little beyond the melting-point, (160° Fahr.) so as to render the composition of a temperature that may be readily manipulated without injury to the hand, or part on which it is applied. Rollers or felt, the latter cut into the shape of the splint required, are to be saturated with the above melted composition, and applied whilst warm and flexible to the limb or joint; when, if needed, further strength and solidity may be given by varnishing a portion of the melted composition over the splint or bandage with a painter's brush, and afterwards smoothing the whole with the palm of the hand, until it assumes the surface of ivory, or the well-known appearance of a paraffine or stearine candle. A fold of linen, dipped in cold water, is finally to be passed round the bandage or splint, which immediately solidifies the melted paraffo-stearine, when the application is complete; and the wet linen may be continued as an evaporating lotion, if desired. Into this bandage or splint, openings may be readily cut by means of scissors curved on their cutting edge into the segment of a circle, or bent to an obtuse angle; the melted composition being afterwards applied over the cut edges of the opening, so as to form a complete solid case, allowing the escape, through such openings, of discharges, and the application of dressings. It will be perceived that, by dividing the paraffo-stearine bandage, and revoving, say half an inch, or separating it into halves, and trimming the edges in the usual manner, splints will be formed having the exact configuration of the part to which they are to be applied, and that these splints can be lined with flannel, wash leather, &c., and strengthened with the melted paraffo-stearine to any extent required.

Mr. Ewen, Jermyn-street, the well-known plaster and bandage manufacturer, has undertaken to prepare and furnish these appliances, accompanied by directions for their employment.* Each bandage will be found soaked in paraffo-stearine, with a portion of the prepared composition in its containing canister, for varnishing the bandage or splint, if needed, *after it has been tightly and evenly rolled, or applied to the affected part.* The felt is supplied in sheets of convenient size, saturated with the composition, from

* They will also be prepared by Messrs. Savory and Moore, of New Bond-street.

which the splints can be cut, and after they have been moulded to the part requiring them as described.

All that is needed before employing these appliances, as prepared ready for use, is to put the canister containing the bandage and a portion of the paraffo-stearine for varnishing into boiling water until liquified; and the piece of prepared felt may be held before a fire or immersed in water a little below the boiling point, until it acquires the requisite flexibility, when it can be fixed where required by the ordinary procedure, varnished and finished by the aid of the canister of paraffo-stearine and brush sold with it, and finally solidified by surrounding it with linen dipped in cold water. Or, the whole of the appliances described can be readily extemporised by the aid of a pound or two of paraffine or stearine candles, a jug or jar in a saucepan of boiling water for melting the same, a rolled flannel, Domett, or other bandage, and a shaving-brush; or, should a splint and not a bandage be preferred, a strip of felt carpet, cut into the required shape, and also rolled together, so as to be immersed in the melted candle composition in the jar.

I have found that the best mode of procuring the stearine, or rock paraffine, when a moderate quantity only is required, is to purchase the candles (so-called) from any respectable tradesman or the candle-companies, asking for the stearine candles used for India, the melting point of which is about 157° Fahr. (the cost is one shilling a pound); or the rock paraffine, which melt at 135°, and cost the same price, at Messrs. Neighbour and Sons, Regent Street. I have observed that a mixture of the two sorts of candles is the most suitable; but either one of them can, of course, be used separately. If this be done, however, the paraffine should be employed in winter and the stearine in summer; and I may observe that all the bandages and splints may, by re-melting, be used a second or third time, thus rendering them amongst the most economical of applications; and it may also be well to mention that, when the removal of a bandage is required, it may be at once softened and taken off by brushing it over with any of the benzines used for cleaning gloves; that of Farey and Regent-street being the most suitable.* Each variety of benzine mentioned, according to my experience of several years, will be found a most useful surgical accessory, not only to clean the skin and hair from all their natural or acquired oily or sebaceous secretions, but also to remove grease, plasters, &c., from the cutaneous surface without causing local irritation; and for these purposes, I have much pleasure in introducing it as a therapeutic agent to the profession, which has the property (as I often say to my patients) of cleansing a living skin as effectually as a dead one; and for such purposes, I doubt not, it will come into general requisition, perhaps even as extensively as glycerine, which I introduced twenty-four years ago, and which I have lived to find the subject of memoirs and special treatises advocating its employment for the purposes for which I originally recommended it, without even the mention of my name.—*British Medical Journal, March* 30, 1867, *p.* 348.

103.—LIQUOR CARBONIS DETERGENS, AND SAPA EJUSDEM.

We have often taken occasion to speak of the benefit derived from antiseptic preparations in the treatment of various derangements of skin and mucous membrane. They are remedies sanctioned by ancient experience, but which modern science enables us to understand the *modus operandi* of, whilst it furnishes them also in more abundant, simple, and convenient forms. We have more than once called attention to the value of such remedies in that very annoying condition, *pruritus vulvæ*, caused, as it usually is, and especially during pregnancy, by unhealthy secretions from the cervix uteri; also in *chronic eczema;* and there are few maladies not dangerous to life which cause more suffering than these two. We are glad, therefore, to have a new form of antiseptic for local use, in the *liquor carbonis detergens*, an alcoholic

* Purified Benzine can also be obtained of Messrs. Taylor of Vere-street, Savory and Moore of New Bond-street, Waugh of Regent-street, &c.

solution of coal tar, containing, we presume, the carbolic, phenic, and other acids, with dark tarry matter, and differing from carbolic acid as the liquor cinchonæ does from quinine. It readily mixes with water, forming a permanent emulsion, and in various strengths is available as a mouth wash, a gargle, an injection for fetid uterine discharges, cancer, retained placenta, &c., gonorrhœa in the female, foul ulcers, sloughing sores, and all maladies depending on, or complicated by parasitic beings: lice, fungi, &c., &c. It is also used in the sick room as a disinfectant, and is combined with soap. The later may be highly useful for medical men who dress offensive wounds, or perform *post-mortem* examinations, as well as for toilet use by persons whose smell, like that of Gorgonius in Horace's satires, is a little too much like that of the goat. Anonymous letters often reach our office, praying for a remedy for foul breath or perspiration. Here is one.—*Medical Times and Gazette, Jan.* 19, 1867, *p.* 76.

104.—NOTICE OF SOME OF THE THERAPEUTIC EFFECTS OF THE BROMIDE OF POTASSIUM,

By Dr. James Begbie, Fellow of the Royal College of Physicians of Edinburgh.

[In the following paper Dr. Begbie limits his remarks to the therapeutic effects of the bromide of potassium in some disorders of the nervous system.]

The bromide of potassium is a valuable calmative and hypnotic. When opium and other narcotics have failed to procure sleep, or when they have succeeded only at the expense of sickness, vomiting, headache, and other consequences, the bromide, free from all unpleasant or injurious effects, will often tranquillize and secure repose. In the sleeplessness which occurs during convalescence from fever, and at the termination of acute diseases, or after the performance of surgical operations, the bromide will be found a safe and efficacious remedy. A dose of from twenty to thirty grains dissolved in a wineglassful of water, or of orange-flower water, administered at bed-time, repeated in the morning, and persistently employed in this way for days, or weeks, will often effect what the most powerful narcotics in daily use have failed to accomplish. A medical man recently called on to undergo a painful operation, by which the whole front of the tibia was laid bare, in connexion with the use of the trephine, and the examination of the shaft of the bone, suffered greatly from restless, sleepless nights. He had had recourse to opiates in the usual form, but without any alleviation. I suggested to him the use of the bromide of potassium in doses of thirty grains, night and morning, which he immediately commenced, and followed with perfect success. He writes me now:—"I derived great benefit from the use of the bromide of potassium. Its effect in procuring sleep was very marked, while it produced none of the unpleasant after-symptoms following the use of opium. In all cases of irritability of the nervous system it will be found, I should think, to have a high therapeutic value."

In those distressing nervous affections the offspring of over-taxed brain, which we are ever and anon called upon to combat in the case of the earnest student, the plodding man of business, or the speculating merchant, cases where, by rising early, and sitting up late, neglecting regular hours of diet, and abandoning exercise in the open air, the whole machinery of life and health have been deranged, and the unhappy victims contemplate nothing short of the wreck of mind and body: in these circumstances, next to rigid hygienic rules imposed by the physician, and carefully carried out by the patient, will be found the amelioration and ultimate removal of the evil, in the use of remedies which have a calmative effect upon the nervous system. Of these the bromides, in my experience, are the safest and the best. An intelligent and hard-working head of a great monetary establishment, who had been obliged from loss of health to resign his position, writes me as follows:—"I write to tell you of the wonderful benefit which even in the course of the first month I had derived from taking the bromide of potassium. I am

sure you will be glad to know that I have not for years been so free of all those painful and disagreeable symptoms which used to affect me,—the constant nervous headache, want of sleep, and breathlessness, both during the day and night. Notwithstanding that in travelling I was unable to take the medicine as regurlarly as I should have done had I been at home, it has worked upon me like a charm." Associated with the cerebral disorder of giddiness and sleeplessness, we often find perversion of the external senses, such as rushing, ringing sound in the ears, &c. These I have found to be quelled and silenced by the use of the bromide, which may be successfully administered in all cases of hyperæsthesia.

[Of the powerful influence for good which the bromides have exercised over epileptiform disorders there can be no doubt. The remedy requires a prolonged use. The system acquires a great tolerance of its employment, and no evil has been observed to result from its long continuance.]

Opium, antimony, aconite, digitalis, and others have all been employed in large and frequently repeated does, as powerful depressants in the paroxysms of acute mania and delirium tremens. The practice is not without its risks. In securing the calmative and sedative effects of the bromides will be found a safer and, I venture to hope, a not less successful mode of practice. I have seen, in two recent cases of violent manaical excitement, a dose of thirty grains of the bromide of potassium, administered every second hour, reduce to quietness the restless subjects, and lay them down in sleep, of which they had for days been deprived. I have not much experience of the remedy in delirium tremens, but I know that it is now on its trial, and I entertain little doubt that it will be successful. In one case its use has been followed by satisfactory results, quickly calming the agitation and excitement, and inducing sleep. In nymphomania, the bromides have been employed with marked success, and Dr. James Struthers informs me that he has obtained most satisfactory results from their administration in puerperal mania. This experience is confirmed by that of other physicians engaged in obstetric practice. In melancholia, attended with fixed delusions and great restlessness, I have found the bromide a powerful calmative. A young woman about thirty years of age, who had been afflicted on a former occasion with deep depression and painful delusions, was lately suffering from a renewal of her malady, in which persistent sleeplessness and dread of impending destruction of all near to her were the prominent features, was quieted, composed, and put to sleep under the use of repeated doses of bromide, and in the course of a few days regained her reason and self-control.

There are several affections of the larynx and bronchi which we have reason to believe have a cerebral origin, or, at least, an intimate connexion with the nervous centres, and through which their treatment may be conducted. Of these, hooping-cough, laryngismus stridulus, spasmodic croup, and spasmodic asthma are examples. The anæsthetic properties of the bromide of ammonium, as manifested on the mucous membrane of the mouth and throat, had led it to be employed in the treatment of the first-named affection, and with a large share of success,—a success depending, however I apprehend, on its more general effects on the nervous system, just as we see the beneficial effects of hydrocyanic acid and henbane in the early stages, and indeed throughout the continuance of the paroxysms, of the disease. No treatment of hooping-cough is apparently successful which is not directed to, and capable of soothing, the nervous element which forms so conspicuous a part in its phenomena. For this purpose I have found the bromide of potassium to possess powers not inferior to any of the narcotic remedies in daily use.

I can only form a conjecture in regard to the therapeutic value of the bromides in laryngismus stridulus and spasmodic croup. I have had no opportunity as yet of testing their operation in these affections, though I have a confident hope that they will be found useful in these and other spasmodic disorders of the excito-motory system of nerves. In spasmodic asthma, which bears a close analogy to them in its manifestations, and an intimate relation to them as a disease of nervous origin, I have obtained the most

gratifying results from the employment of the bromides. In two cases of long standing, which had resisted all approved methods of treatment, and where the patient had renounced all hope of benefit from drugs, the use of the bromide of potassium in full doses, night and morning, was followed by a remarkable remission of the fit,—the patient in one case having slept for several consecutive nights without the return of the asthmatic paroxysm, a circumstance which had not occurred for years. In the second case the result was equally satisfactory.

When Professor Claude Bernard demonstrated that the increased formation of sugar by the liver, and its presence in the blood is the result of some exciting cause which acts by reflex action, conveying the stimulus to the medulla oblongata, whence it is propagated by the spinal cord and great sympathetic nerve to the liver; and when he also showed that in cutting the pneumogastric nerve the secretion of sugar was stopped, but that it still took place when the floor of the fourth ventricle was irritated after the division of the nerve; and when these experiments were followed by results obtained by Dr. Harley and others, showing that local irritation of the liver itself can produce saccharine urine; when we consider also that a saccharine condition of the urine frequently follow injuries of the brain, and that disease of that organ is sometimes the immediate cause of death in those labouring under diabetes, we found a new view of the pathology of that disease opened up to us. When we bear in mind, also, the alterative and absorbent effects of the bromides on the liver, and their remarkable power in soothing and calming irritability of the nervous system, we might be encouraged to employ such an agent in the treament of diabetes. The physiological fact, the pathological condition, and the therapeutic principle, make it fairly applicable, and lead us to expect satisfactory results.

Towards the close of January last, a gentleman, aged 60, residing in the north of England, consulted me regarding the well-marked symptoms of diabetes, under which he had long laboured. He had been for three months under the care of Mr. Welford of Sunderland, and by his advice came to Edinburgh. He had been treated by the remedies considered of most avail, and by the diet considered essential in the management of his malady; but he had lost ground. He had long been dyspeptic. He was now thin, pallid, and emaciated. His skin was cold and dry; his pulse rapid and feeble; his tongue red and tender; his gums spongy and apt to bleed; his thirst was excessive; his appetite voracious; his bowels were constipated, and he suffered from bleeding piles; his urine was pale, and voided frequently and in large quantity. It was of high density, and loaded with sugar. The region of the liver was tumid and somewhat tender. The diet of animal food he had hitherto been permitted was continued in restricted quantity, and the free use of succulent vegetables was allowed, together with a liberal use of claret. All medicine hitherto in use was suspended, and the bromide of potassium, in doses of 20 grains, was prescribed, and ordered to be taken three times a day. The treatment was steadily pursued. From week to week a marked improvement was perceptible. The skin gradually became moist and warmer, the tongue and gums less raw and tender. The appetite and thirst abated; the calls to pass urine were less frequent and urgent, and the quantity voided sensibly decreased; the density of the secretion fell, and the sugar by degrees became less and less, till, on the third week of March, six weeks after commencing the treatment by the bromide, not a trace of it remained, and Mr. H. returned home apparently and confessedly quite well. Desirous, however, of ascertaining whether he continued so, I wrote to Mr. Welford at the close of May, and received from him the following:—"From the time of Mr. H.'s return home up to the 14th of March he continued quite well. Whether he caught cold, or committed some indiscretion in diet, I don't know; but I was called to see him on that day, and found him suffering from pain and tenderness over the liver, thirst, dry tongue, increased secretion of urine, sp. gr. 1 032, with a slight trace of sugar. I prescribed medicine to act gently on the liver and bowels, still continuing the bromide; and, am happy to say, left him quite well on the 14th of May, not the slightest

trace of sugar remaining, or any other bad symptom. I believe he still continues the bromide every morning; I requested him to do so as you wished. Should anything occur I shall let you know." Mr. W. adds, "I have had under my care a lady suffering from diabetes, and, am happy to say, after a short time she has improved most wonderfully by taking the bromide and nothing else."

Shortly after this experience, I was consulted, in conjunction with Sir James Simpson and Dr. Ross of Dingwall, in the case of a lady from the north of Scotland, who had for three years been labouring under diabetes. The disorder was well marked in all its prominent features, and the health had seriously declined. I mentioned, in consultation, the result of the two cases just recorded, and we agreed to recommend the bromide, and prescribed it accordingly. After some weeks had passed I heard from this lady that her health had much improved, and that her more distressing symptoms were greatly moderated. The medicine, however, had, she thought, made her nervous and emotional, and it had been discontinued. The urine is still saccharine. Sir James Simpson, in afterwards referring to this case, mentioned to me another in which the remedy had entirely succeeded. The history, I hope, he will give to the profession.

A young gentleman under the care of the late Mr. Alexander, and subsequently under that of Dr. Smart, by whom I had been consulted, had long laboured under diabetes, and had, under different remedies, appeared for a time to improve derived no benefit from the use of bromide after a short trial, and resorted to the south of France, where, under a genial sky and the use of the dietary prescribed by Dr. Pavy, he greatly improved. On his return, however, his urine was found still loaded with sugar, which a subsequent use of the bromide for a short time has not been effectual in reducing.

A young gentleman, aged 13, under the care of Dr. Burn, labouring under diabetes, of nine months' duration, in the course of which many remedies and careful dietetic rules had been followed without affording relief, commenced the use of the bromide of potassium in the beginning of September last. At that time he was pale and emaciated, with cold dry skin, and rapid and feeble pulse. His appetite was morbid and capricious; he was particularly addicted to the consumption of confections in no limited degree; his thirst was excessive. He passed, night and day, an inordinate quantity of urine, of high specific gravity, containing a large amount of sugar. He complained much of occipital headache, and any attempt to laugh was followed by a peculiar crowing inspiration twice repeated. Dr. Burn has informed me from time to time of his progress, which has been steadily towards improvement. In addition to the bromide, I should mention that cod-liver oil has been in use. Under these means, carefully pursued for seven weeks, and without attention to diet, the restrictions of which could not be carried out, the urine has fallen to a normal quantity; and no trace of sugar remains. The skin is moist and soft, and of natural temperature. The appetite for ordinary food is returning, and the thirst has entirely abated. The pain at the occiput still, however, continues, and the peculiar crowing inspiration, when the risible faculties are moved, marks a feature in the case, and indicates its nervous origin.

These cases sufficiently show that there are forms of diabetes in which the functional arrangement of the liver, and the production of sugar, are arrested by an agent whose operation is that of a sedative to the nervous system. It would be premature at the present moment to speculate on the amount of success that may attend the exhibition of the remedy in the varying circumstances in which the disease presents itself. This paper is a mere notice. A larger experience is required.

That a remedy, possessing apparently so little power as the bromide of potassium, should have been suggested in the treatment of cholera, a disease so grave in its character, so rapid in its course, and so fatal in its results, may appear to many inexplicable; nevertheless, the phenomena of cholera, in its earlier stages, point to its intimate connexion with disorder of the ganglionic system of nerves, with irritation of the nerve-centres and vaso-motor nerves, and with spasm of the capillary vessels, and obstructed circulation.

To arrest this condition as early as possible seemed a clear indication of treatment; and the bromide of potassium, as possessing decided power in allaying irritation of the nervous system, and of relaxing spasm of the muscular fibre, was proposed by me as a possible means of allaying at least some of the more urgent symptoms of the disease. It was introduced into practice upon no empirical ground, and with no expectation that it was to be found a cure for the disease. The very first trials of it in the Leith Cholera Hospital were such as to justify the confident hope that it would be found useful; and its subsequent employment there, as well as in the Edinburgh Cholera Hospital, has not disappointed expectation. In the two institutions named, the former under the superintendence of Mr. Niven, the latter under that of Dr. Stevenson Smith, and also in private practice, I have had many opportunities of witnessing its effects, and am now prepared to say that the bromide of potassium, though not possessing the properties of an antidote to the poison of cholera, though not a specific to the shock of this terrible disease, has certainly stript it of some of its terrors.

No one, I believe, who has with unprejudiced mind given himself the opportunity of watching the effect of the remedy in the earlier stage of collapse, can have failed to observe the remarkable remission of vomiting and the arrest of cramp which follow the exhibition of five or six doses of twenty or thirty grains, at the interval of an hour or half an hour, and the speedy return of warmth and colour to the previously cold and livid surface. To these indications of reaction there follows the cessation of the rice-water dejections, and the secretion and voiding of urine. Here, it may be said, its efficacy terminates; and certainly there is no need of pushing its use further. It has done good service. It has removed the only pain the patient suffers—the agony of cramp. It has arrested the vomiting and diarrhœa. It has arrested the tendency to death; and now there opens to the observing physician a second stage in the aspects of this mysterious disorder, and an opportunity of suggesting remedies more suited to the new phenomena which succeed. Even so we relinquish our means of cure fitted for the cold stage of fever, and betake ourselves to remedies more befitting the hot and sweating periods which follow after. The use of the bromide is contraindicated so soon as reaction has set in. Its known physiological action precludes its use when drowsiness and stupor and other symptoms of oppressed brain begin to manifest themselves. I have not satisfied myself, however, that the use of the drug in the earlier stage tends to a fuller development of these in the latter, as some are inclined to believe.

Who doubts the efficacy of the antimonial opiate associated with the name of Dr. Graves, in the treatment of the nervous element in fever? Opium and antimony, however, cannot always be administered with advantage in such cases, and camphor and henbane and other sedatives often fail in securing relief. In the bromide of potassium we have an excellent substitute, one which can be administered with wine or other stimulant, and whose power to calm in such circumstances I have lately tested with satisfaction. Who distrusts the anti-periodic power of quina in ague, or what can we look to but arsenic if cinchona fails? A sufferer from quotidian ague, after large and repeated doses of quina during the interval, had his regular accession of cold, and hot, and sweating stages unaffected by the specific. The sweating stage was unusually protracted and exhausting, and at the end of a fortnight no mitigation was effected. He was advised to take a full dose of the bromide of potassium every three hours during the remission, and, with one imperfect paroxysm, he got quit of his malady.

When the long list of anti-neuralgic remedies, so called, has been exhausted, and when the hope of the physician has died away with the fading prospects of the patient; when no palpable or suspected organic mischief gives rise to the want of success in the use of well-tried and approved remedies, and when no constitutional diathesis stands in the way of well-directed skill to overcome; in those anomalous forms of neuralgia let me ask a trial of the bromide of potassium. It will, now and then, in its own gentle way, reprove the employment of more heroic treatment which had antici-

dated its use, and demonstrate that a calmative, in such cases, frequently succeeds better than a counter-irritant.—*Edinburgh Medical Journal, Dec.* 1866, *p.* 484.

105.—ON THE EFFECTS OF IODIDE OF POTASSIUM.

By Dr. R. S. Sisson, Malda Hill.

There are several ways of preventing the catarrhal symptoms caused by the exhibition of iodide of potassium. In susceptible persons the dose must be small, much diluted, and taken on an empty stomach. It may be combined with carbonate of potash, which prevents iodine being set free in the stomach. It may be administered in combination with ammonia, which acts on the skin, and so relieves the mucous membranes; or it may be combined with laudanum.—*Lancet, Dec.* 29, 1866, *p.* 742.

106.—TWO CASES OF POISONING BY OVER-DOSES OF THE FLUID EXTRACT OF GELSEMINUM.

Reported by Ezzin P. Davis, Esq., of Parkersburg, W. Va.

On the evening of October 6th, 1866, I was called to visit Mr. C. H. B., a young lawyer of our city, who was reported as being very ill. I answered the call immediately, and found him in the following condition:—

He was lying upon his left side, face somewhat congested, pupils dilated, but responding to the different degrees of light; eyelids half closed, with apparent inability to move them; lower jaw drooping, and his tongue to use his own expression, "was so thick he could hardly speak;" his skin was warm and moist; pulse small and feeble, and his respirations somewhat diminished in number. He had neither purging nor vomiting.

Upon my questioning him as regards his condition, he told me that "he and a friend had been enjoying themselves in a social way for some three or four days," and that nothing was the matter with him now "but extreme nervous prostration." He also told me that he had not taken medicine of any kind. Thinking, as he did himself, that he was merely prostrated from excessive dissipation (he being of a very nervous and delicate constitution), I ordered him a brandy punch, and went to the drug store for some medicine.

Whilst waiting for the prescription to be filled, his friend Mr. S. came staggering into the store, saying, "I am blind; I cannot see. What in the world is this I have taken? (at the same time showing a bottle.) My friend B. is down town in the same fix." I examined the bottle, and found it plainly labelled "Fluid Ex. Gelseminum." I asked him how much they had taken? He replied, "B. and I have each taken a tablespoonful." I immediately sent my student, Mr. White, to see Mr. B. and give him an emetic, with other remedies to be given after he had vomited. I then gave Mr. S. an emetic, which acted freely; after which I gave him Quin. sulph. ℥j., in spt. vin. gal. ℥iv. In a few minutes Mr. White returned, and said Mr. B. was dying; and that it was with great difficulty that he got him to swallow the emetic, which had not acted. Dr. A. G. Clark accompanying me, we hastened to where Mr. B. was, and found him in a dying condition, pupils widely dilated, spasmodic breathing, surface cold and congested, pulse almost imperceptible, and totally unconscious. Mustard was applied to the extremities, his body sponged with hot brandy, and artificial respiration; but all to no effect. He died at 8:30 p. m., about two hours and a half after he had taken the poison.

I returned to Mr. S.; found him still inclined to sleep, with deep inspiration, and a numbness of the whole body. I repeated the quina and brandy, but in only one-half the quantity given before, and kept him walking about,

with the aid of two of his friends. At ten o'clock he was feeling quite comfortable. Considering him out of danger, I sent him to bed, when he slept soundly all night, waking in the morning feeling, as he said, "quite well, but weak and dizzy." He recovered without any further difficulty.

The fluid extract taken by the above parties was prepared by Tilden and Co., New Lebanon, N. Y. There being no antidote to poisonous doses of gelseminum given in the U. S. D., I was at a loss to know how to act and what to do. But acting upon general principles, I first vomited Mr. S. freely, and then gave him the large doses of quina spoken of above. My reasons for giving the quina were these: gelseminum being a powerful nervous sedative, when taken in large quantities, acting upon the brain and nervous system generally, and quina being a cerebral stimulant, I thought that large doses of quina might rouse the nervous centres to action; through this to restore tone and vigour to the heart, and equalize the circulation. I am satisfied that the quina had a good effect, for Mr. S. had taken the gelseminum nearly ten hours before he took the emetic, giving the system time to come thoroughly under its influence. I am satisfied that had Mr. S. waited, and sent for a physician, that he would have shared the same fate as his friend and companion; that the time lost in so doing would have placed him beyond the reach of medical assistance.—*American Journal of Medical Sciences, Jan.*, 1867, *p.* 271.

107.—FATTY DEGENERATION OF MUSCLE.

By C. Macnamara, Esq., Surgeon to the Calcutta Ophthalmic Hospital.

It seems probable that, in proportion as advances are made by opticians in the perfection of the higher powers of the microscope, it will be necessary for us to reconsider some of our ideas regarding various points of pathology, and in connexion with this subject I purpose making some remarks on fatty degeneration of muscle.

I shall confine my observations to a specimen sent me by Dr. Francis, being a portion of the walls of the heart of a patient who died rather suddenly in the Medical College Hospital from fever. On making a *post-mortem* examination, the heart was found to be in an advanced state of fatty degeneration, portions of it looking more like tough yellow adipose tissue than muscular fibre.

I divided this specimen into two parts. The first (A) was put by to soak in Price's glycerine for a month, and the second (B) was submitted to the action of an alkaline solution of carmine. The power employed in examining these specimens was a Powell and Lealand's fiftieth of an inch glass.

The first point which struck me on looking at the portion marked (A) was the disintegrated appearance of the muscular fibre. It seemed as if it had been minced up into small particles on the glass slide, or as if the pressure of the covering glass had pulverised it, having evidently lost its toughness and elasticity.

A considerable quantity of fatty matter was observed adhering to, or replacing the sarcolemma, and concealing to a great extent the transverse bands of contractile tissue within it; the specimen seeming at first sight to consist of an amorphous mass of fatty matter. On making a more careful examination, however, a large proportion of the characteristic elements of striped muscle could be seen within the fatty sarcolemma; and even in a preparation such as that under consideration, representing an extreme case of fatty degeneration, I believe I am within the mark when I assert that one-half of its contractile bands were in working order, although the whole of the sarcolemma was altered in character. The apparent brittleness of the muscle above noticed extended to the ultimate fibres, so that longitudinal pieces of them were in places chipped or broken off, and the extremities of the separate transverse bands could be clearly seen. In other places one or

more of the transverse bands protruded from the end of a broken ultimate fibre, like a coil or thread of tissue, and if altered by fatty changes it reminded me of a small piece of worm-eaten wood. Consequently, although the contractile bands appear, after long soaking in glycerine, to consist of a homogeneous substance, they are, nevertheless, capable of undergoing fatty degeneration similar to that of the sarcolemma, and yet of retaining their form. These pathological conditions tended to confirm me in the ideas I had gained regarding the minute anatomy of muscle when studying that subject. I may remark that precisely similar abnormal appearances are to be found in the fibres of the lens in certain forms of cataract. It by no means follows, because in a specimen of this kind we find much of the contractile tissue in a comparatively normal condition, that other parts of it are not completely destroyed; on the contrary, a considerable part of it was disintegrated, forming an amorphous fatty mass, but retaining the general outline of the ultimate fibre.

We may readily conceive, however, that the contractile tissue remaining intact was sufficient to fulfil, although very imperfectly, the work for which it was required; and we may further understand, from the pathological changes above described, the reason why, in a case of this kind, the heart's action is so remarkably weak, nearly one-half of its working material having been destroyed or rendered almost useless. This fact also accounts for the feebleness of the heart's sounds in a case of fatty degeneration; the intensity of the sounds evidently depends somewhat upon the degree of its muscular development, and, consequently, if nearly half of the muscle is destroyed, the sounds must be reduced in an equal proportion,—assuming that the sound heard over every muscle, in the act of contracting or dilating is caused by the friction and coiling of its bands of contractile tissue.

Doubtless the sounds of the heart are for the most part due to other agencies, which would also be influenced by the weakened state of the fatty muscle, but still one-half of the sound, whatever its intensity in health, which is produced by the friction of the bands of contractile tissue against one another, must be wanting in a case of excessive fatty degeneration. I will venture a step further, and assume that a portion of the heat of the body arises from the action of these contractile transverse bands. It is almost impossible to form an idea of their number, but the space covered by them must be prodigious, and considering the constant movements to which the muscles are subjected, and, therefore, the amount of friction thus brought into play, we may well conceive that a part of the heat of the body is engendered from this source; for not only have we to consider the amount produced by friction, but also by the forces necessary to maintain the tension and relaxation of the contractile bands, which are as capable of generating heat as combustion. It appears doubtful if muscular force ever ceases unless, as a result of disease (paralysis and the like); certainly the heart's action continues as long as life lasts, so that the apparent inaction of the muscles during sleep is no valid objection against that of its heat-producing powers. If this be the case, it is not improbable that electricity is developed from the same source; and it is the fact that indications exist of the presence of an electric current in a muscle during sleep which made me state it was likely a certain amount of force was exerted by its contractile bands, although apparently at rest. I am well aware that the chemical changes going on in the body may produce the phenomenon of heat and electricity referred to, but when we have evidence of the existence of a source of these forces as palpable as that presented to us by the minute anatomy of muscle, we should certainly allow it its due weight when considering these matters. If, therefore, my premises are true, a less amount of sound, heat, and electricity should be evolved from a muscle in a state of fatty degeneration than in a healthy muscle, because in the former a vast quantity of the friction, tension, and relaxation of the tissue which occur in the latter must be destroyed.

The second portion of the specimen under consideration (B) was examined more particularly with regard to its germinal matter. From this and other examples of the same kind, I would lay it down as a general rule that so

long as the germinal matter remains intact the longitudinal and transverse bands of contractile tissue will be found in working order. In certain forms of disease—as, for instance, in paralysis—they become atrophied; but if the germinal matter remains healthy, no sooner is it thrown into action by a restoration of the communication with the nervous centre than it at once takes on an increased action, and the wasted muscle is brought into use and resumes its former bulk. It is doubtless an assumption to a certain extent to talk of the pathological changes, noticed in a specimen of this kind, depending on faulty action in the germinal matter, and not on chemical changes; in fact, both these forces appear to bear a share in the process. It is evident, however, that so long as the germinal matter presents its normal appearance, the contractile tissue retains its usual form and functions; as the germinal matter becomes broken up and destroyed, the contractile tissue entirely disappears, and an amorphous fatty substance takes its place, no new formed material (contractile tissue) being produced, and the old structure having undergone disintegration and decay.

I am hardly, as I before remarked, in a position to assert that the diseased action commenced in the germinal matter, because it may reasonably be asked, why resort to such a theory and not take it for granted that these fatty changes begin in the sarcolemma, and gradually involve the germinal matter and all the other structures of which the muscle is constructed? From analogy, however, I judge that the disease in this instance is attributable to a fault in the formative process, because, as Dr. Beale has long since demonstrated, the opposite condition to fatty degeneration exists in the germinal matter of parts marked by excessive growth—as, for example, in scirrhus. The amount of germinal matter to be seen in a specimen of scirrhus is very remarkable; the tissue, when coloured with carmine, appears in a perfect blaze, giving one the idea of intense action going on in the part. In abnormal specimens of less active growth, the germinal matter, though in excess, is far from assuming the proportions it does in scirrhus; or, in other words, excess of germinal matter is tantamount to rapidity of growth. If this be an axiom in pathology, then the converse probably holds good, and the decrease of germinal matter noticed in the specimen under examination is consistent with the absence of formed material, and in its place the product of the changed contractile tissue. The blood is doubtless necessary to the life of the tissues, but whether it is capable of maintaining the structures of the body in a normal condition without the intervention of the germinal matter is more than doubtful. Like a river, the blood supplies necessary moisture to the part through which it flows, and in turn receives back its watery particles laden with the used-up material of the soil, to be reconverted into useful substance or otherwise employed. The blood, however, may be perfectly healthy, but as the vital force (the peculiar property of germinal matter) lessens—as, for instance, in old age—fatty changes occur in the tissues. On the other hand, if the circulating fluid is wanting in certain elements demanded by the germinal matter for the production of formed material, fatty degeneration also follows. In this way we can account for the reparative changes sometimes noticed in tissues that have undergone fatty degeneration; for so long as the abnormal state of the blood continues, upon which the disease depends, the contractile tissue of muscle, for instance, degenerates and cannot be reformed, but immediately the blood improves in quality, the germinal matter is again able to perform its function, and formed material is produced, the diseased structures being replaced by healthy ones.—*Med. Times and Gazette, April* 20, 1867, *p.* 412.

108.—HYDROSTATIC ATOMISER OR EXSUFFLATOR.

By Dr. G. J. Arnold, Roxbury, U. S.

Since fluids were first atomised for local anæsthesia, various more or less perfect methods have been adopted for the purpose. The more common apparatus consists of India-rubber bulbs, so arranged that while one acts as a bellows the other is designed by its elasticity to keep up a constant and equable pressure. Although excellent in theory, practically it frequently disappoints; for besides other defects, it requires an assistant, and it is almost impossible for one person to keep up an uniform current for more than one or two moments, on account of the extreme fatigue to the muscles of the hand in working it. Steam has been used, but of course is not always available, and has its obvious disadvantages. The hand air or force pump has been employed, but this also necessitates an assistant, even for the slightest operation. To obviate these and other defects, hydrostatic pressure has been resorted to, and apparently with most satisfactory results.

The apparatus consists of two closed cylindrical vessels (Nos. 1 and 2), each capable of holding one or more gallons of water. On the side of each, close to the bottom, is a short tube (*a* and *a*`), with an aperture not exceeding five-eighths of an inch in diameter. At the top of each is a stop-cock (*c* and *c*`) of one-eighth of an inch delivery. These apertures may be varied in size, according to the size of the vessels. The stop-cocks being closed, vessel No. 1 is filled with water. The two vessels are then connected by a flexible tube (*a* and *a*`), the larger aperture of the one with the larger aperture of the other. The atomiser (*b*) is connected by means of a small flexible tube with the stop-cock (*c*`) of the empty or air-vessel, No. 2. Elevate the vessel of water (No. 1) and open both cocks; the water will of course displace the air in vessel No. 2, and force it through the atomiser. Sufficient pressure is secured by an elevation of ten feet, and the height of an ordinary room answers very well. When the air has been entirely displaced in vessel No. 2, change the atomiser tube from No. 2 to No. 1, reverse the position of the vessels, and the fountain will be renewed without the escape of a drop of water. The principle here involved is familiar to all.

In houses supplied with aqueduct water, the water-tube of the apparatus (*a*—*a*`) may be connected with a hydrant, and thus one of the vessels be dispensed with—the air vessel only being retained.

All the effects of rhigolene, or concentrated ether, are secured by this apparatus. With rhigolene, the thermometer has been reduced from 72° above to 10° below zero, Fahrenheit, in ten seconds.

The following are some of its advantages:—

1. By it a continuous, uniform, and equable current can be obtained at any time.

2. Two or more atomisers can be employed at the same time. This is important where it is desirable to operate on a large surface at once.

3. In an office, the whole apparatus can be constantly ready for use at the shortest notice,

4. The current can be graduated to a nicety with regard to force, and be continued as long as required.

5. It obviates the necessity of skilled assistants, without imposing upon the surgeon the distracting labour of manipulating the apparatus when his attention is required in the more important processes of an operation.—*Boston Medical and Surgical Journal, Dec.* 27, 1866, *p.* 434.

109.—ON POLYPUS OF THE NOSE, MORE PARTICULARLY IN REFERENCE TO ITS TREATMENT.

By THOMAS BRYANT, Esq., Assistant Surgeon to Guy's Hospital.

[The diagnosis of polypus of the nose is not quite so easy as some think. The cases are not rare which are brought under our notice as examples of polypi in which the symptoms present are without doubt due to the presence of a deformed nasal septum, or a thickened state of the mucous membrane covering the lower turbinated bone; indeed, any disease causing symptoms of obstruction to a nasal passage is, as a rule, set down as being one of polypus.]

There has hitherto been but one kind of practice adopted for the treatment of these nasal polypi to which anything like success can be attributed, and that is, their forcible abruption by means of instruments. Some surgeons employ a large pair of well-made forceps, which are carefully applied to the pedunoles of the growths; whilst others prefer the "noose," or instrument by which a wire or cord is slipped over the body of the polypus, and its neck encircled. In both instances the growth is forcibly torn away from its attachments, and relief afforded. As far as it goes this treatment is doubtless good, and may be employed whenever the polypus is of sufficient size to require interference; but all surgeons are aware of the unsatisfactory condition of patients who have been thus treated. It is true the chief portions of the disease for which the surgeon has been consulted may be removed, and a certain measure of relief afforded to the patients; but how long can this relief be promised? How soon will the same symptoms of the disease reappear, and a fresh operation be demanded, to be followed by the same relief, relapse, and surgical interference? We all know these cases may go on during the patient's life; that the period of immunity from the disease may vary in different patients, or even in the same patient at different periods; but we also know that, as a rule, a return will take place, and that sooner or later a repetition of surgical treatment will be called for.

It was this unsatisfactory state of matters which induced me to look about for a different plan of treatment, and having now employed it for some years with invariable success, I can with considerable confidence recommend it for general adoption. I am disposed to regard it as a practical wrinkle of no mean value in the treatment of a hitherto very intractable affection, and it is with some little pleasure that I now bring it publicly before my professional brethren. I propose to demonstrate the practice by the quotation of cases.

Case 1.—The first case in which I was led to adopt the practice, in the year 1862, was in a young woman, E. C., aged 32, who had been under my care at Guy's Hospital for several years. She had both nostrils affected with polypi, and for this she sought relief about every three months. Her nostrils were remarkably small, so that the operation for removal was one of difficulty. I had tried the injection of astringent lotions with no success, or with so little that it was not worth describing under that name, and gave them up. I then looked about for some powerful astringent that might be locally applied, and that would yet be innocuous to healthy mucous membrane, and found it in *tannin*. I ordered this to be used as a *snuff*, the patient to get some friend to blow it daily up the nostril through a quill. In one month this patient came to me well. Both nostrils were quite clear and free from all signs of disease. The patient was under my observation for three years afterwards, and no return of the affection made its appearance.

Case 2.—The second case I propose to quote occurred in the person of a gentleman, aged 52, who had polypoid growths in both nostrils for ten years. When he came under my care, in July, 1864, both nostrils were completely plugged. On the left side the nose was filled even to its external orifice; on the right the growth occupied the posterior nares, and was not visible in front. I cleared the left nostril with tolerable ease by means of the instrument I generally employ—the "noose,"—taking away one of the largest polypi I ever removed. Some bleeding followed the operation, and as the

polypus of the right side could not be brought forwards for manipulation, its removal was postponed for one week. I thought, however, it would be well to try the effects of the tannin in this case, and prescribed it as in the last. The following week, when I saw this gentleman again, he came into my consulting room with some spirit, saying that he was all right; that on the third day after the use of the snuff a polypus as large as the one I had removed from the left nostril had come away from the right, and that he was quite well. This gentleman was ordered to keep some of the snuff by him, and to use it on the slightest indications of obstruction to his nose. He has remained well ever since, and when I saw him early this year he was quite free from the disease.

Case 3.—Sarah S., aged 60, had been the subject of polypus in both nostrils for many years. She had been under my care for several years, and had been operated on five times, the last operation having been performed three months previously. When I saw her on the 19th of February, 1866, her nose was full of polypi, even to the external orifice. Although an extreme case of the disease, I deemed it right, as an experiment, to try the effect of the tannin, used as a snuff; and on March 12th (three weeks afterwards) the nose was quite clear. From the day of its use the growth began to wither and slough off. By the 26th of March, on a careful examination of the nostrils, no signs of the disease could be made out. The mucous membrane also appeared healthy. I saw this patient on the 28th of May, and she was still well.

Case 4.—Stephen B., aged 31, came to me on the 24th of March, 1866, with nasal polypi completely occluding the right nostril. He had had the disease six or seven years, and had been operated upon many times, the last being about a year ago. Tannin was ordered as a snuff, and on the fourth day (March 29th) the growth had much diminished: it was evidently withering. He had then a slight passage. On the 5th of April the polypus had disappeared, and he could breathe freely through the nostril. On the 5th of May he was still well.

Case 5.—James S., aged 60, came under my care on the 10th of May, 1866. He had been the subject of nasal polypi in both nostrils for about five years, and had been operated upon three times. Both nostrils were completely filled, no passage existing through either side. Tannin was ordered, and on the 20th of June he could blow through both nostrils, no signs of the disease existing. On the 10th of July he was quite well, the nose looking as healthy as it could be.

Case 6.—George G., aged 56, came under my care at Guy's Hospital on Oct. 8th, 1866. He had had polypi of both nostrils for some years. He was operated upon in Nov., 1865, and again in April, 1866. When he came under my notice, both nostrils were completely filled with small polypi. Tannin was ordered as a snuff, and in two weeks the nose was clear, no signs of disease existing. I saw him one month subsequently, when he was well.—*Lancet, Feb.* 23, 1867, *p.* 235.

110.—AN INGENIOUS BULLET DETECTOR.

A very ingenious piece of mechanism for the detection and extraction of bullets in wounds has been devised by Mr. Sylvan De Wilde. It seems that at the time Garibaldi was suffering from the effects of an undetected bullet in his limb, and pained by the fruitless efforts of operators to detect it, it occurred to several individuals of a philosophic turn of mind that electricity might very well be employed in the detection of metallic substances lodged within the human tissues. In France, M. Edmond Langlois, M. Favre, and Dr. Lecompte of the French Army Medical School at Val-de-Grâce, assisted by M. Rhumkoff, all made use of it in the elaboration of suggestions on the point. There is this manifest advantage, that the structures of the body are non-conductive—a fact that renders the action of the electric current

Mr. De Wilde has apparently produced the most practical result; and his instruments have been submitted to the naval and military authorities, who have made a complimentary report about them. The apparatus consists of a probe and forceps, a battery, and an alarum, contained in a box eleven inches long by three broad, and two inches and a half deep. The elements for the generation of a current, which remains constant for some weeks, are zinc and carbon. The probe, consisting of two steel wires, insulated from each other, is connec ed with an electric horseshoe magnet and a bell, and when (introduced into the wound) it touches the bullet the circle is completed, and the bell rings. The forceps act on the same principle, and are intended first to detect then to seize, the bullet. They have curved points, and not pallets or spoons. The points of the probe are kept sheathed on introduction to a wound, and not uncovered till the supposed bullet is felt. This is effected by means of a sliding tube. The advantages of Mr. De Wilde's probe over others of its kind are very marked, and the army and navy officers will no doubt find it a great aid. The probe is a sensitive artificial finger, which enters deeply into the tissues, and gives the signal at once when it detects the hidden source of mischief below.—*Lancet, May 11, 1867, p. 578.*

SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOLLOWING PAGES: SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

AFFECTIONS OF THE SYSTEM GENERALLY.

CANCER.—To relieve the pain caused by injecting scirrhus with dilute acetic acid, add a third or fourth of a grain of acetate of morphia to the acid solution injected. The severe pain which is sometimes produced is quite done away with. (Dr. Fleming, Mr. P. Stewart, p. 24.)

Injections not applicable to Primary Cancer.—In our present state of knowledge of the treatment of cancer it does not seem right to essay a remedy so little tried, and the adequacy of which in cases of primary tumour is so uncertain. Both disappointment and damage have resulted, to the writer's personal knowledge, from an experimental use of acetic acid in cases of primary cancer of the breast, which were fitted for removal by the knife. The treatment is very applicable to the dispersion of secondary tumours (as of the glands in the axilla). Whilst primary tumours are large and growing, the acid can only be thrown into them in small quantities, and at intervals. If used in a large quantity, it produces suppuration or sloughing, a disastrous action of a remedy in primary cancer. (Mr. C. W. Moore, p. 21.)

PYÆMIA.—No drug is to be depended on in the treatment of pyæmia; the proper use of food and stimulants is our anchor. The constant administration of suitable food in small quantities is more to be recommended than the free use of stimulants. The latter are such potent agents, and so valuable, that we should not be careless of their profuse expenditure. If we are lavish of them at first, they may the sooner fail us afterwards, when life more immediately hangs upon the effects they produce. Brandy is the most suitable stimulant. Pyæmia was a very frequent cause of death during the American war; and the use of sulphites and hyposulphites was not found to be of any advantage. Of all medicinal agents, the most valuable are probably the alkalies, which promote the oxidation and destruction of unstable organic compounds. Liebig says: "A number of organic compounds acquire, by contact with, or in the presence of a free alkali, the power of combining with oxygen (of burning), which alone they do not at all possess at the ordinary temperature of the air, or at the temperature of the body. The depressing action of alkalies is not so great as is generally believed. The bicarbonate of potash is the salt most suitable to cases of pyæmia. (Mr. W. S. Savory, p. 28.)

TYPHUS AND OTHER ASTHENIC FEVERS.—*Chlorate of Quina.*—In the graver forms of typhus, typhoid, scarlatina, small-pox, low phlegmonous inflammation, &c., chlorate of quina is stated to be a remedy of a highly satisfactory character. (Dr. Lyons, p. 262.)

ZYMOTIC DISEASES.—*Sulphites.*—The reason of the non-success of the salts of sulphurous acid in the treatment of fevers is twofold. First, the treatment is not commenced in time. It should be given before the blood has

become loaded with poison and deteriorated in quality. Secondly, the hyposulphites have been used instead of the sulphites. Hyposulphites become oxidized in passing through the system. Sulphite of magnesia is most suitable for internal administration, and sulphite of soda (from its great solubility, is most suitable for external use as a lotion. (M. de Ricci, p. 18.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Acute Mania.—*Bromide of Potassium.*—In two cases of violent maniacal excitement, a dose of thirty grains of the bromide of potassium, administered every second hour, reduced the patients to quietness, and procured sleep, of which they had been deprived for days. (Dr. J. Begbie, p. 266.)

Anæmia, Dyspepsia, and General Debility.—*Electricity.*—Faradisation (the use of the secondary current), when applied thoroughly, with the negative pole at the feet and the positive pole down the spine and over the stomach and bowels, for a number of chronic asthenic affections, is a far more effective remedy than any internal tonic. (Dr. G. M. Beard, p. 63.)

Delirium Tremens.— *Capsicum.*—Capsicum is a remedy of considerable value in cases of delirium tremens. It produces a sense of warmth and comfort in the stomach, when first taken, allaying the agitation, debility, and cardiac and epigastric anxiety, which are such constant and distressing features of the disease. It should be given in from twenty to thirty grain doses, made up in bolus with honey of roses. (Dr. Lyons, p. 59.)

Indian Hemp.—In a case of delirium tremens, twenty minims of the tincture of Indian hemp was given every four hours. After the third dose the patient fell into a deep sleep, which lasted about four hours. The use of opium was inadmissible, as he had formerly been an opium eater. (Mr. H. Tyrrell, p. 58.)

Pain.—*Narceine.*—Narceine is a very valuable remedy in all those cases in which morphia is either not tolerated from the beginning, or in which it has lost its effect from long use. Its effects are well seen when it is used in hypodermic injection. No unfavourable symptoms are produced, such as headache or sickness. There is generally a diminution in the frequency of the pulse. (Dr. Eulenberg, p. 260.)

Narceine is about four times weaker than morphia. The latter is more suitable to relieve pain, but the former should be used where it is desired solely to procure sleep. Narceine is very useful as a sedative to allay cough. (Dr. Oettinger, p. 261.)

Sleeplessness.—*Bromides.*—A dose of from twenty to thirty grains of bromide of potassium, dissolved in a wineglassful of water, administered at bed-time, repeated in the morning, and persistently employed in this way for days or weeks, will often effect what the most powerful narcotics in daily use have failed to accomplish in the sleeplessness which occurs during convalescence from fever, and at the termination of acute diseases, or after the performance of surgical operations. In many such cases opium only produces sickness, vomiting, or headache. (Dr. Begbie, p. 265.)

Narceine.—Narceine is coming into great fashion amongst the French, to replace morphia. It may be given in doses of from a sixth to half a grain. It produces sleep "which is soft, tranquil, uninterrupted, and followed by a quiet awaking." It does not produce constipation. (Dr. Eulenberg, p. 260.)

Tetanus.—*Calabar Bean.*—The use of Calabar bean in the treatment of tetanus is likely to prove of service. The action of the bean in sufficient doses is to paralyse the voluntary muscles, the very muscles which are spasmodically contracted in tetanus. A good preparation for internal use may be made by dissolving extract of Calabar bean, twelve grains, in white wine, one ounce. Every five drops of this contains one-eighth of a grain of the extract. Such a dose may be given every half-hour, the effects being carefully watched. In the first case of two related, a semi-comatose condition was induced

after a time. The administration of the doses near together is found necessary, as their effects are very short-lived. Subsequently in the case, by a mistake of the apothecary, much larger doses were given than was intended, with the effect of producing complete relaxation of all the muscles, with alarming symptoms both in the heart's action and in the respiration. It seems better to increase the frequency rather than the strength of the doses. (Dr. E. Watson, p. 51.)

Tobacco Infusion.—A case of severe tetanus is recorded, in which marked amelioration of the symptoms followed the direct application of an infusion of tobacco to the found. The injury was an extensive lacerated wound of the calf. The infusion contained half an ounce of tobacco to the pint of water. The report of the case is as follows:—"Within two or three hours after the application of the tobacco, the improvement was most marked. All the rigid muscles became, to a considerable extent, relaxed; the mouth could be opened about half an inch, the paroxysms were less severe and frequent, and a good deal of sleep was obtained. (Mr. J. B. Junor, p. 57.)

Idiopathic Tetanus.—A case of idiopathic tetanus, treated by nicotine, is related by Mr. Crawford, Clinical Clerk to Dr. Lyons, of Dublin. Tobacco enemata were given, also the following pills:—R. Nicotinæ, gtt. duas; ext. gent., q. s.; ut fiant pil. viij. St. j. tertius horis. The treatment is reported to have had a perceptible effect on the spasms. (Dr. Lyons, p. 55.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ACUPRESSURE.—*Advantages over Ligatures.*—The walls of the vessel are held together in apposition by a material which does not tear or irritate their coats, and which can be withdrawn in a day or two, leaving no extraneous body in the wound to prevent its speedy and complete healing. On the other hand, a ligature causes mortification of the artery at the tied point, and usually also below it, and we have as many dead and foreign bodies as we have tied vessels, and as many setons saturated with decomposing fluids as we have ligatures. (Sir J. Y. Simpson, p. 149.)

To arrest Hemorrhage from Scalp Wounds by Acupressure.—In ordinary cases, after clipping the hair short with scissors, and then shaving the part, the best plan doubtless is the usual one, viz., to bring the parts well together with adhesive plaster. But when the patient is intoxicated, or has to be removed some distance home, secondary hemorrhage is very liable to occur from removal of the strapping. In such cases pass a needle through the skin from without inwards, a quarter of an inch from one end of the wound, and to one side of it. The needle is then pushed along the under or raw surface of the lip of the wound, till the upper angle is reached, when it is made to reappear. Another needle must now be passed along the other lip of the wound. Ligatures must now be passed around the projecting extremities of these needles, so as to compress each lip of the wound separately, and then the edges of the wound can be brought together by a few turns of thread passed from one needle to the other. In twelve hours or so the needles should be withdrawn, and the ligatures left. The ligatures being soaked in blood form a hard scab, under which the wound heals. It is sometimes difficult to remove the needle in twelve hours, if so, it may be left twenty-four or thirty-six hours, when it will be found quite loose. (Dr. J. Dunlop, p. 152.)

ANEURISM.—*Temporary Wire Compresses.*—Mr. John Dix, of Hull, in Dec., 1865, successfully treated a case of carotid aneurism by temporary compression of the arteries by a wire compress. The circulation was entirely arrested for six days, and the compress then withdrawn. Acting on this hint, Mr. Pridgin Teale, of Leedes, has lately treated a case of popliteal aneurism by the same plan. The femoral was exposed, and a piece of silver wire passed around it at the apex of Scarpa's triangle; by means of a needle the ends of the wire were then passed through the sartorius, and obliquely outwards

through the skin, at a distance of an inch and a half from the wound. The wound was then closed, and the two ends of the wire—being about one-third of an inch apart—were tied over a small piece of cork, and tightened so as to compress the artery, and stop the pulsation in the aneurism. The rest of the history of this case is unfortunate, as diffuse erysipelas, originating in a slight blush at the point where the counterpressure was made by the small piece of cork, had carried off the patient. Before this, however, set in, the pressure had been distributed over a larger surface by means of a piece of splint five inches by one. It was found, after death, that the artery had been cut through, but that the divided ends were perfectly closed; this was accounted for by the long period of time during which the wire had been left, viz., fifteen days. Mr. T. suggests that the circulation should be completely arrested, which was not done in this case. It is also evidently advisable to distribute the counterpressure over as large a surface of skin as possible, and not to employ only a small substance, which is liable to cause injurious pressure on one point. (Mr. T. Pridgin Teale, p. 155.)

Aneurism of the Palmar Arch.—This always results from injury. A case successfully treated by compression is related. By means of a tourniquet light pressure was kept on the brachial, a bandage was applied from the hand upwards, and cork pads were placed upon the radial and ulnar above the wrist. At the same time the forearm was flexed. At first, on account of the tension and redness of the skin over the aneurism, it was thought unadvisable to use any pressure in the palm; but subsequently, when the redness had subsided, and the sac had become somewhat consolidated, a cork pad was placed also over the site of the aneurism. The aneurism was completely cured by this plan of treatment. (Mr. S. Jones, p. 157.)

HEMORRHAGE FROM WOUNDS.—*A new Styptic Fluid*, "STYPTIC COLLOID."—Dr. Richardson of London has introduced a compound fluid, which is at the same time a styptic, an antiseptic, and a complete means of excluding wounded, abraded, or ulcerated parts of the body from the influence of the external air. The object to be aimed at in the manufacture of this fluid is to saturate ether entirely with tannin and a colloidal substance xyloidine, or gun-cotton. In the first step of the process, the tannin, rendered as pure as it can be, is treated with absolute alcohol, and is made to digest in the alcohol for several days. Then the ether, also absolute, is added until the whole of the thick alcoholic mixture is rendered quite fluid. Next the colloidal substance is put in until it ceases readily to dissolve. For the sake of its very agreeable odour, a little tincture of benzoin is finally admixed. The solution is now ready for use. It can be applied directly with a brush, or, mixed with equal quantities of ether, it can be applied in the form of spray. When applied to a surface the ether and alcohol rapidly evaporate, and the tannin and gun-cotton are left stranded on the surface, forming with the blood, or the secretion of the surface, a kind of membrane almost like leather. This liquid must be applied to wounds in this way:—Having brought together the edges by sutures, apply the solution freely over the wound and between the edges, next cover the wound with a thin layer of cotton-wool saturated in the liquid, and finally, the whole may be coated over with another layer of the solution. When the ether has nearly evaporated a little dry cotton may be placed over the part, or if pressure is wanted, a bandage may be applied. If a cavity has to be treated, the fluid is more neatly and handily used as spray. In cases of compound fracture, after the parts have been brought into apposition as far as possible, and fixed in the necessary position, the fluid should be poured slowly into the open cavity, so as to fill it. Then the parts externally should be covered with a layer of cotton-wool saturated with the solution. Carbolic acid, iodine, or morphia may be combined with the "styptic colloid." (Dr. B. W. Richardson, p. 140.)

LIGATURES TO ARTERIES.—*New Plan.*—When the vessels have been tied by means of a needle, pass the ligatures through the skin close to where they are tied. They remain quite quiet and come away without the slightest pain or trouble when their work is done. The wound consequently has nothing to irritate it, and enjoys every opportunity of healing by the first intention

The plan leaves the parts as quiet as if acupressure had been applied. (Mr. Campbell De Morgan, p. 157.)

VARICOSE VEINS OF THE LEG.—In Mr. Lee's operation for varicose veins of the leg the vessel is divided between two ligatures. Mr. Wood, of King's College Hospital, operates by including the dilated vein between a needle in front and a double metallic wire behind. The needle and wire are introduced through the same openings, the latter first, and it is twisted as tightly as possible round the two projecting ends of the needle. No sores or other troublesome consequences ever ensue. (Mr. J. Wood, p. 158.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

ASTHMA, SPASMODIC.—*Bromide of Potassium.*—In two cases of asthma of long standing, where the patients had renounced all hope of benefit from drugs, the use of bromide of potassium in full doses, night and morning, was followed by a remarkable remission of the fit, the patient in one case having slept for several consecutive nights without the return of the asthmatic paroxysm, a circumstance which had not occurred for years. In the second case the result was equally satisfactory. (Dr. J. Begbie, p. 267.)

CHRONIC BRONCHITIS AND HEART DISEASE.—*Prunus Virginiana.*—The wild cherry has an action upon the heart very similar to that of digitalis. Where there is painful disturbance of action combined with feebleness, it is invaluable. In cases of mitral disease it is very useful. In cases of chronic bronchitis with feeble circulation it often relieves the symptoms so much as to enable old-standing cases to resume some kind of work. The tincture is the most suitable preparation, it should be given in doses of ℥xx. ℥xxx. five or six times a day. (Dr. Clifford Allbutt, p. 258.)

CROUP.—*Advanced Stages of.*—The indications in treatment are first, to relieve the spasm of the glottis by chloroform and the vapour of hot water inhaled; secondly, to reduce the œdema of the mucous folds above it, which may be sometimes successfully done by the application of a strong solution of the nitrate of silver by means of the laryngeal sponge-probang. If this does not answer the œdematous parts should be pricked or incised with the laryngeal lancet. This may be thoroughly recommended in suitable cases. The third indication is the use of measures for the expulsion of the false membrane through the natural openings. This is best accomplished by emetics, of which the most suitable is ipecacuan and sulphate of zinc, antimony produces too much depression. When tracheotomy is successful, it is generally in a case of œdema glottidis without any exudation. (Dr. Eben Watson, p. 91.)

GOUTY BRONCHITIS.—In a considerable number of cases of chronic bronchitis there is a history of gout. This is to be borne in mind in the treatment. When there is gouty bronchitis, the more characteristic forms of the disease are not usually present. (Dr. H. Greenhow, p. 77.)

HOOPING COUGH.—*Hydrophenyl.*—Hydrophenyl or benzine, a substance contained in the purifying chambers of gas works, if placed in small quantities in the room or bed of a child suffering from hooping cough produces exactly the same smell as is observed in gas works, and has the effect of relieving the distressing symptoms sometimes rapidly. Dr. Lochner tried the plan on his own child, and he states that the precursory symptoms lasted a week, and the disease itself only six days. Dr. Lochner, p. 97.)

PNEUMONIA.—Crepitation is the auscultatory sign which characterises the stage of engorgement, and practically is the first sign on which we can depend as indicating the existence of pneumonia. A stage of dryness with intense arterial injection *precedes* this state of engorgement and is indicated by a harsh, loud, puerile respiratory murmur. This is merely an exaggeration of the healthy sound, and is the result of the dry and swollen condition of the pulmonary membrane; this gives rise to a constriction of the mouths of the air-sacs. (The air-sacs communicate with the bronchial tubes by a

circular opening which is smaller than the cavity to which it leads.) (Dr. A. T. H. Waters, p. 84.)

Polypus of the Nose.—*Tannin.*—The treatment of nasal polypus by removal either by forceps or ligature is very unsatisfactory, the growth returning again rapidly and requiring again removing. Mr. Bryant, of Guy's Hospital, finds that tannin used as snuff, whilst it has no effect on the healthy membrane causes the complete withering up and disappearance of the polypus. It should be blown daily up the nostrils with a quill. The removal of the polypus before the tannin is commenced is not even necessary. The best, however, is that the polypus does not return, and the case is permanently cured. (Mr. T. Bryant, p. 275.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

Cholera.—*Bromide of Potassium.*—Dr. Niven, of Leith, states that in the four cases of cholera in which he has employed bromide of potassium, the most remarkable success has followed. He used it in doses of half-a-drachm every hour, and found that it excited so powerful an effect upon the nervous system as very shortly to put a stop to the cramps. (Dr. Niven, Dr. Begbie, p. 269.)

Diphtheria.—*Permanganate of Potash.*—A gargle or permanganate of potash (gr. x. to the ℥xx.) is very useful in cases of diphtheria. It must be used very frequently, and iron and port wine taken internally at the same time. Having had the disease personally, the author treated himself upon this plan and found much relief from it. (Dr. W. W. Campbell, p. 99.)

Diphtheria and Ulcerated Tonsils.—Carbolic acid is an excellent application to the throat in cases of diphtheria and ulcerated tonsils. It may be given in form of a gargle, but in children the throat may be freely swabbed out with it on a piece of sponge. The following is the best formula. ℞. Acidi carbolici ♏xx., acidi acetici ʒss., mellis ʒij., tinct. myrrhæ ʒij., aquæ q. s., ut fiat gargarisma ℥vj. The carbolic and acetic acids to be well shaken together, the honey to be added with the water gradually. Quinine and tincture of iron should be given internally. (Mr. C. Sedgwick, Jun., p. 102).

Strangulated Congenital Inguinal Hernia.—This form of hernia is only in adults called congenital, owing to its occurring in the vaginal process of the peritoneum. It is usually sudden in its occurrence. There is no gradual process of development such as is observed in the ordinary inguino-scrotal rupture. It projects in a remarkable manner from the external outlet of the inguinal canal, being of a more globular form than the ordinary form of hernia which is pyriform. In these cases the stricture is generally extremely tight and the taxis less frequently successful. Operative interference must not be long delayed or severe mischief will be occasioned to the gut. (Mr. Prescott Hewett, Mr. Birkett, p. 159).

Severe Colic and Constipation.—*Belladonna.*—An interesting case of colic with constipation is related. Opium not having relieved the pain, nor copious injections of gruel or caster-oil produced any evacuations, leeches were applied. The abdomen however became very tender on pressure, and the pulse rose to 108. The patient was now ordered a pill containing half a grain of extract of belladonna every four hours, with belladonna ointment to the abdomen, a warm bath at night, and a caster-oil enema twice a day. On the following morning after taking four of the pills, and the pupils being moderately dilated, the patient had a copious feculent motion. The pills were repeated twice daily, and the bowels continued to act regularly and copiously. (Dr. Murchison, p. 102.)

AFFECTIONS OF THE URINARY ORGANS.

Atony of the Bladder from Stricture of the Urethra.—In cases of stricture, even after the stricture is cured, the patient is sometimes found

to have lost the power of emptying the bladder. This is not owing to paralysis, but to atony of the muscular fibre from over-distension. The treatment required is regular relief of the bladder by catheterism, along with good food, and the exhibition of tincture of iron, or citrate of iron, and strychnia. (Mr. T. B. Curling, p. 169.)

DIABETES.—*Treatment by Perspiration.*—A case is related by Sir Henry Marsh, of Dublin, which exhibits in a striking point of view the powerful effects of copious perspiration, produced by the vapour bath and muscular exertion, in controlling and restraining the symptoms of diabetes. Before the treatment was commenced, the patient is described as being in a state of "alarming debility." On the 27th of April he was placed in the vapour bath, half an ounce of the tincture of opium being mixed with the water which was to be converted into steam. He remained in the vapour bath twenty minutes. This was repeated every four or five days with great benefit. It generally excited copious perspiration, followed by sound and refreshing sleep. Before this plan of treatment was commenced, the necessity of assuaging his thirst and voiding his urine was so continual during the night that he could scarcely obtain any sleep. After it had been continued until the 3rd of June, the urine was diminished to eight pounds daily, the skin perspired freely, there was a great accession of strength and diminution of thirst and appetite. The patient was now put on laborious exercise, while the body was enveloped in thick flannel, and the weather unusually warm. The first efforts were difficult and reluctant, but before the close of each day, when perspiration was fully established, the labour was easy and the fatigue trifling. His ordinary diet consisted of eggs, beef, mutton, soup, and milk; and his drink lime water with milk and beef tea. Improvement was once retarded by a severe febrile attack, but was upon the whole continuous after the commencement of this plan of treatment. (Sir H. Marsh, p. 105.)

DISEASED KIDNEYS.—*Effect on the Success of Operations.*—It is a remarkable fact that damaged kidneys have as a rule much more influence upon the result of an operation or injury than a damaged heart, although the action of the kidneys is not so immediately necessary to life as that of the heart. This is probably because the kidneys are called upon to accomplish extra work in excretion and purification of the blood at a time when they are unequal to even the ordinary duties of their office. (Mr. W. S. Savory, p. 44.)

LITHOTRITY.—Mr. Henry Thompson in no case declines to employ lithotrity, unless in cases of old and narrow stricture, or of exceeding large and hard stone, rendering crushing impossible. Mr. T. claims to have established the following propositions respecting lithotrity:—1. That lithotrity is capable of freeing elderly patients from stone a ta very small risk, if well-constructed instruments, with delicate manipulation, be employed, and if watchful care be exercised in the management of the patient. 2. That the success of lithotomy has never been in any way comparable with that of lithotrity. In the mode of operating by Mr. Thompson, the following notes are worth remembering: Preliminary injections are never used. Mr. Clover's apparatus for removing fragments is occasionally useful; by far the greatest number, however, do not require it. Chloroform is rarely required. Large fragments should not be removed as such, but should be pulverised and allowed to be expelled by the natural powers. No benefit can accrue from the removal of fragments whole, as compared with their removal in powder. It is certainly a safe and useful plan to instruct the patient to pass no water during the first twenty-four hours after a sitting, except in a recumbent position on his back. The fragments soon become water-worn, and therefore less sharp. (Mr. H. Thompson, p. 162.)

After-Treatment of Lithotrity.—There can be no more important element in the after-management of a case of lithotrity, or a point more conducive to the success of the operation, than early removal of the detritus, and without injury to the prostate or urethra. The plan of injecting the bladder is very unsatisfactory, on account of the feeble force of the return current. An instrument devised by Mr. Clover, of London, withdraws the injected liquid by *suction.* This instrument is an important auxiliary in the after-treat-

ment of lithotrity. It consists of "a glass cylinder, two inches long, and two inches wide, having an eight-ounce India-rubber ball at one end, and a vulcanite mount at the other, in which is a hole which fits closely to a collar fixed just above the rings of the catheter, so as to allow the catheter to project three-quarters of an inch inside the glass vessel." The instrument may be procured from Weiss, of London. (Mr. Clover, Dr. G. H. Porter, p. 163.)

SEDIMENT TUBE FOR URINE.—Some time and care is generally required to obtain the lowest portions of a urinary sediment for microscopic examination. To obviate this Dr. Basham recommends a portion of the urine to be placed in a tube terminating inferiorly in a small and neat tap. This tube is mounted on a stand (see woodcut), and may be obtained for a small cost from Messrs. Griffin and Sons, of Garrick-street, Long-acre. When the sediment is deposited, the lowest portion may be let off on to a piece of glass by turning the tap slightly. (Dr. W. R. Basham, p. 111.)

STRICTURE OF THE URETHRA.—*Immediate Treatment.*—Mr. Holt asserts that in all cases of stricture of the urethra, where the stricture has been fairly split, the best known results are obtained. He considers that it must ultimately supersede all other modes of treatment. The stricture rarely returns, even when the after-treatment has been neglected; and after the lapse of years it will be found that the same instrument can be passed which was admissible at the time of the operation. One precaution is necessary. A small gum catheter must be passed and retained in the bladder for a few hours, and the dilator introduced immediately on its withdrawal; and if this is kept in the urethra, there need not be the slightest hesitation in at once *rapidly* thrusting the chosen tube between the blades of the instrument. If the dilator is not fairly in the bladder, the result must be a failure. (Mr. B. Holt, p. 165.)

AMPUTATIONS, FRACTURES, DISLOCATIONS, &c.

AMPUTATION AT THE SHOULDER-JOINT.—*New Method.*—It is a most excellent plan, in excision of the head of the humerus, to expose the bone by a single linear incision, beginning immediately external to the coracoid process. It is striking with what ease disarticulation may be thus accomplished, and moreover, from the deltoid being divided so far forwards, there is no trouble with bleeding from the trunk of the posterior circumflex artery. If, however, it is found on exposing the head of the bone, that amputation at the shoulder-joint is necessary, the incision may be carried back from the lower end towards the posterior fold of the axilla, and the result will be found to be even better by this than by the ordinary method. The first incision must be carried downwards through the clavicular fibres of the deltoid, as far as the lower edge of the humeral attachment of the pectoralis major. If the deltoid is unusually large, it is well to dissect back the skin and fat a little, and to divide the muscle rather higher up, so as to avoid redundancy of muscular fibre. The nerves must be gently pulled out and cut off as short as possible, so that they may not become implicated in the cicatrix. It is also a good plan to expose the artery, tie it in two places, and cut it between the ligatures. (Mr. J. Spence, p. 128.)

COMPOUND FRACTURE.—*Carbolic Acid.*—The reason that a compound fracture usually proves so much more dangerous to life, and serious in its results to the limb, is not the simple access of oxygen, but of the septic particles which always exist in the atmosphere. These act like yeast, producing decomposition in everything susceptible of it. The truth of this has been proved by the philosophic researches of M. Pasteur. In a compound fracture, twenty-four hours after the accident the coloured serum which oozes from the wound is already distinctly tainted with decomposition. This state of things is enough to account for all the bad consequences of the injury. By the application of carbolic acid to the wound this decomposition of the blood and other effused fluids may be prevented. Carbolic acid forms with the blood a solid crust, which prevents the access of these septic particles

contained in the atmosphere, and retains for a long time its antiseptic properties. Having put up the limb comfortably, lay on the wound a piece of lint soaked in carbolic acid, and allow it to remain undisturbed. If looked at at the end of several days, no signs of suppuration will be found. If any blush of redness occurs round the sore the lint may be removed, and the wound dressed with water having a small proportion of carbolic acid diffused in it. As carbolic acid is almost absolutely insoluble in water but dissolves readily in the fixed oils or glycerine, these may in some cases prove very suitable applications. In some cases it is well not to remove the lint at all, but to cover it with a piece of very fine and thin block-tin, to prevent the evaporation of the volatile organic acid. A firm crust is formed by the blood, lint, and carbolic acid, beneath which no suppuration occurs. (Mr. Joseph Lister, p. 113.)

Diseases of Joints, Fractures, &c.—*Paraffo-Stearine as a Substitute for Plaster of Paris or Starch.*—Bandages or felt immersed in melted paraffo-stearine and applied to the part whilst hot form an inexpensive, useful, cleanly, elegant and efficient application in all maladies or injuries where rest, equable support, and solidity of the parts affected are required. Paraffo-stearine is a combination of equal parts of rock paraffine and stearine, as used for candles. This may be coloured with alkanet root to a flesh tint. (It may be obtained so coloured in convenient canisters from Mr. Ewen, of Jermyn-street, London.) When used it must be heated to about 160° Fahr., and the bandage or felt saturated with it. After application the surface may be smoothed with the palm of the hand until it assumes the surface of ivory. The best way of procuring the material when a small quantity is wanted, is to purchase stearine candles. The melting point of those used for India is 157° Fahr. (Mr. J. Startin, p. 263.)

Excision of the Knee-Joint.—*After-treatment of.*—Dr. Watson, of Edinburgh, recommends the following apparatus in the after-treatment of cases of excision of the knee-joint. It consists essentially of two parts—1. A suspension-rod made of iron, about the size of No. V. of trade wire gauge; 2. A modelled Gooch splint, long enough to extend from the tuberosity of the ischium to beyond the heel. The suspension-rod extends from the groin to the extremities of the toes, and is bent to the outline of the limb, departing from it only in the situation of the excision, where it forms a bow or arch. To the upper surface of the rod are attached one or more hooks by which suspension is effected. The Gooch splint should not be made too wide, and should not surround the thigh and leg to more than two-thirds of their circumference. It should be scooped away laterally, at a part corresponding to the site of the excision, and should have an aperture cut corresponding to the tendo Achillis and heel. In this apparatus the limb must be encased by means of an open-wove roller bandage applied from the toes upwards. The whole must be rendered immovable by means of either plaster-of-Paris or paraffine rendered temporarily liquid by heat, and applied by means of a painter's brush. The splint must be well padded before application, and the padding near the site of operation covered either with paraffine or gutta-percha tissue. The limb may then be swung by the ankle hook of the suspension rod from a Salter's swinging cradle. (Dr. P. H. Watson, p. 130.)

Joint Affections.—*Forcible movements.*—There are some obscure affections of the knee-joint which are curable by forced movements. In the most common cases the "lock" usually takes place with the joint moderately bent, and the leg rotated outwards. It must be unlocked by extremely bending the joint, then rotating the leg inwards, and then suddenly and forcibly extending it. The rule seems to be to first move the joint as far as possible in that direction which is most easy, then forcibly to move it in the direction in which the lock occurs. There are some cases of stiff joint from involuntary muscular contraction, these are most common amongst the young, and remain after some injury, the direct effects of which have been cured. These cases are curable by forcible movements of the joint. Any joint is liable to this, including the cervical vertebræ. If there is any doubt about the diagnosis, chloroform will decide it. (Mr. J. Paget, p. 136.)

SLIPPING OF A TENDON.—The tendons of the peroneus longus may slip at the point of the outer malleolus; and an extensor tendon of a finger may slip over the heads of a metacarpal bone and first phalanx. These may be made out by feeling the displaced tendon and the gap where it should be, and may be reduced by relaxing the slipped tendon as much as possible, and replacing it with lateral pressure and sudden stretching. The long tendon of the biceps may slip from its groove, when there is noticed a slight forward prominence of the head of the humerus, its drawing up under the acromion, nad the pain at the lower end of the biceps on stretching it. It is questionable, however, whether this displacement can ever be so fairly made out as to be reduced. (Mr. J. Paget. p. 136.)

SPRAINS.—*Friction.*—When a sprained joint does not progress satisfactorily, but, although all signs of inflammation have disappeared, remains weak, cold, and painful on movement, the proper treatment is friction with movements forcible to a certain degree. Let the surgeon begin by handling, rubbing, and pressing the sprained part and its neighbouring structures very gently. After doing this for fifteen or twenty minutes, the rubbing and pressing may be increased in hardness, and the joint may be more freely moved, especially in the direction opposite to that in which it was forced by the accident. Another quarter of an hour or more thus spent, is to be followed by rougher proceedings of the same kind, till even severe pressure and wide and violent movements can be borne without pain; and then in an hour or so the cure is deemed complete, or so nearly complete as to require only a slighter treatment of the same kind on the next day. (Mr. J. Paget, p. 139.)

UNION BY THE FIRST INTENTION.—Living tissues contain not only vessels, nerves, muscles, and blood, but interstitial fluid from which solid tissues are formed. This interstitial fluid which leaves the tissues when exposed to the influence of water and oxygen rapidly decomposes, and hence we have the cause of non-union of wounds by the first intention. To secure union by the first intention in ordinary wounds, it is necessary to thoroughly dry the surface so that no water may be left to excite decomposition, and to bring every part into close contact so that no moist air may be left behind. Lastly, when the lips of the wound are closed, we should seal up the wound with a fluid which perfectly anneals structure, such a fluid is the "styptic colloid." Even the peritoneum might be opened under special conditions. These are fully detailed at p. 204. (Dr. B. W. Richardson, p. 146.)

AFFECTIONS OF THE SKIN, ETC.

ECZEMA.—In nine out of ten cases of eczema indican may be detected in the urine of eczematous patients by spectrum analysis. Indican is supposed to be due to a retardation of the process of declension from the complex to the more simple of the products of function and secretion. It has a highly complex formula, and may be broken up with ease into leucine, indigo, and glucine. This retardation is probably due to accumulation of urea and other products of waste in the blood, owing to deficient renal secretion. (Dr. F. Smith, p. 201.)

Chronic Eczema and Pruritus Vulvæ.—The liquor carbonis detergens is an alcoholic solution of coal-tar, containing carbolic, phenic, and other acids, with dark tarry matter, and differing from carbolic acid as liquor cinchonæ does from quinine. Mixed with water, with which it forms an emulsion, it is an excellent local remedy in cases of chronic eczema and pruritus vulvæ; it is also useful as an injection for fœtid uterine discharges, and for gonorrhœa in the female, and as an application to foul ulcers, sloughing sores, and parasitic diseases. (Ed. Med. Times and Gazette, p. 264.)

NÆVUS.—When the skin is not greatly or at all implicated, make an incision through it, dividing it into two halves. Each half may then be snipped out piecemeal with a pair of curved scissors. The cure is effectual and rapid, and a hardly visible cicatrix is left. (Mr. F. Jordan, p. 202.)

Enucleation of Nævus.—There exists in most cases of large nævis a distinct capsule, which will enable the surgeon to enucleate the tumour without cutting wide of the disease, and thereby endangering large blood-vessels. Acting on this principle, Mr. Pridgin Teale, of Leeds, removed a rapidly growing nævus, measuring three inches by four, situated over the right parotid gland. The tumour was chiefly subcutaneous, but involved the skin near the lobe of the ear, to the size of half a crown. The nævoid skin was preserved, along with the sound skin, as a cover to the wound. The knife was kept close to the capsule, and was used very sparingly in separating the deep parts of the tumour, which extended to such a depth that half an inch of the internal jugular vein was laid bare, and the finger could be placed upon the styloid process. Recovery was rapid. (Mr. T. Pridgin Teale, p. 201.)

PRURIGO SENILIS.—Four-fifths of the cases of prurigo senilis depend on the pediculus corporis, and should be called phthiriasis. It nearly always attacks the shoulders and neck first, and subsequently spreads to the trunk and lower extremities. It is not exclusively confined to old people. Many very obstinate cases of prurigo of months' duration have been cured in a week by the use of an ointment consisting of half an ounce of olive oil, half an ounce of lard, and two drachms of the powder of stavesacre; at the same time more frequent change of linen, and care of washing of it in boiling water. (Mr. B. Squire, p. 198.)

RINGWORM (*Tinea Tonsurans*).—Paint over the surface affected, with a firm brush, a preparation composed of two drachms of iodine dissolved in an ounce of colourless oil of tar. It forms a cake, which separates at the end of a week or fortnight. It may require to be repeated once or twice, but not often more frequently. It causes no pain, and is not liable to cause abscesses or destruction of the hair follicles, such as often result from deep blistering. The oil of tar is obtained by distillation from the common tar, and has a specific gravity of .853. (Dr. Coster, p. 199.)

SKIN DISEASES.—*Caution as to the use of Flannel.*—When there is a congestive state of skin, or any disposition to neurosis, do not let the patient wear flannel, but place it, if necessary, outside the linen; this will prevent any "catching cold." The diseases in which this is advisable are, chiefly, erythemata, roseola, urticaria, certainly syphilodermata in their early stages, scabies, and prurigo. A remembrance of this little practical point will sometimes give us the greatest cause to be thankful that we attended to it, trifling though it be. (Dr. Tilbury Fox, p. 196.)

Phenic Acid.—The value of the liquor carbonis detergens probably depends upon the phenic acid contained in it. It is well, however, to use the phenic acid in the form of lotion after the parts have been fomented with hot water and dried. It is very useful in prurigo senilis, pudendi muliebrum, eczema in its chronic form, and scabies. (Phenic acid may be obtained from Mr. Cooper, of Oxford-street.) (Mr. W. Harding, p. 199.)

VENEREAL AFFECTIONS.

GONORRHŒA.—This should be treated as a simple non-specific disease. In case of a first attack, in which inflammation runs high, a purge, hot bathing, and an alkaline medicine, either diuretic or aperient as may be indicated, followed by an injection of sulphate of zinc, two grains to the ounce. (Mr. Barwell, p. 215.)

The disease being entirely local may be cut short in its earlier stages effectually and safely by a strong lead lotion (liq. plumbi diac., ℥j., aquæ, ℥ vij.) In the ordinary acute form of the disease, injections of warm water and weak lead lotion, together with bicarbonate of potash and henbane internally are found to relieve the symptoms. This treatment should be followed up by a sulphate of zinc injection when the acute symptoms have subsided. *Chordee* is effectually relieved by the application of extract of bella-

donna and glycerine along the under surface of the organ, combined occasionally with a sedative pill (opium or henbane) at night. *Orchitis* in the acute stage yields readily to antimony in combination with sulphate of magnesia. (Mr. C. Heath, p. 216.)

"*Disinfectant Treatment.*"—Let the patient inject every two hours a solution of carbolic acid and bicarbonate of potash, made in the proportion of half a fluid drachm of the former to a drachm of the latter, in a pint of water. The diet and other accessories as usual. (Mr. W. S. Watson, p. 217.)

SYPHILIS.—*Mode of Introduction into the System.*—The question has been long debated, and was one proposed for solution by the Venereal Committee lately, whether an abrasion or breach of surface is necessary for the absorption of the syphilitic virus. This may pretty safely be decided in the negative, although it will, of course, more readily enter if there is a raw or abraded surface. Dr. Frazer, who has had a very large experience in India, has seen sores heal at once; or perhaps, there was a mere scratch which healed immediately, but was followed by the usual secondaries. For this reason the induration of glands in the groin, as a diagnostic mark, is more to be relied upon than is the character of the chancre. The usual period of incubation of the syphilitic poison is a month, but cases sometimes occur in which it is nearly twice that period. There can be no doubt but that syphilis can be conveyed from one person to another by means of the secretions: and even the blood. Two cases are related by Dr. Wilks, illustrating the inoculability by the latter fluid. In one the experiment was directly made by an Italian physician upon himself, in the other, a surgeon cut his finger whilst operating on a syphilitic patient, and in consequence took the disease. Women may inoculate men with the disease (indurated chancre) by means of the vaginal secretion alone, the mucous membrane being intact. (Dr. S. Wilks, p. 203.)

Mercury.—At one time mercury was looked upon in the light of an antidote to syphilis, but it is now evident that it has no direct effect upon the disease, but only upon its effects. Its influence appears to be exerted merely on the general secreting apparatus of the body, and so, by promoting absorption, assists in getting rid of many of the morbid results of syphilis. Similar effects of the drug are seen in the removal of a bronchocele, enlargement of a lymphatic gland, or a pleuritic effusion. Iodine and potash have also analogous effects. It is evident, then, that however much good may be effected at first by the administration of mercury, the symptoms will recur again and again. A practical lesson follows from this: instead of considering that mercury is a remedy for the earlier stages, and that at a later period tonics are required, this drug may be found useful even when the cachectic condition of the patient would have rather contraindicated it. The good effects of more active treatment will often be seen in patients whose condition had suggested merely wine, quinine, cod-liver oil, and such like remedies, but where a true syphilitic action was still in operation. (Dr. S. Wilks, p. 209.)

Duality of the Syphilitic Poison.—A patient may become proof against any further inoculation from a suppurating sore, whilst the secretion from a suppurating sore will produce upon the same patient a specific pustule. The converse of this is also true. Again, a patient may have a series of soft suppurating sores without any constitutional effects being produced. He may thus have an indurated sore followed by the ordinary train of secondary symptoms. The suppurating sores do not prevent or modify the indurated sore, and the indurated sore, on the other hand, does not prevent the repeated inoculation of the secretion of the suppurating sores. (Mr. H. Lee, p. 212.)

AFFECTIONS OF THE EYE AND EAR.

CATARACT.—Von Graefe, of Berlin, has introduced a modification of the ordinary linear extraction of cataract. He performs iridectomy after the corneal section is complete, making the point where the iris is removed to coincide with one angle of the wound. He insists upon the complete removal of the strip of iris from its attachment. The capsule is then to be lacerated and the lens extracted, if possible, without the introduction of any form of traction instrument, simply by the gliding pressure of the back of the spoon upon the sclera above the wound. When the lens does not readily yield to pressure, the use of the traction-hook is recommended, and will be required in about one operation out of eight. In making the corneal section he recommends the formation of a conjunctival flap, covering the whole length of the wound; this promotes rapidity of healing and firmness of cicatrix. (Prof. Graefe, p. 170.)

Scoop Extraction.—The mode of operating in scoop extraction of cataract will be found minutely detailed at p. 174 by Mr. Soelberg Wells.

Senile Cataract.—The various operations for the cure of senile cataract are three, viz., the flap operation; the scoop operation; and Graefe's operation. The flap operation undoubtedly presents the best results when it is successful. The risk is in the size of the incision so impairing the vitality of the cornea as to induce partial or even diffuse suppuration, and in prolapse of the iris. For a new beginner, the easiest and safest operation is the downward flap operation, for when the section has been successfully completed, the chief danger and difficulty are past. In the scoop extraction (see *Retrospect*, vol. lii.) these two principal dangers are nearly completely eliminated, but it is without doubt a more difficult operation than the common flap extraction, and for its successful performance demands a cool, dextrous, and practised operator. The incision also has to be followed by iridectomy. If the success of von Graefe's operation is as eminent in other hands as in his own it will in all probability supersede the scoop and flap operations. It not only offers all the advantages of the former, viz., the administration of chloroform (inadmissible in the flap operation) and the linear shape of the incision, but yet one more very important one, that in the great majority of cases the lens may be removed without the aid of any traction instrument This operation is described in the present volume. (Mr. J. S. Wells, p. 177.)

CORNEAL OPACITIES.—In cases of diffuse corneal opacity resulting from parenchymatous inflammation, inject into the conjunctiva, immediately around the cornea, a solution of chloride of sodium (a scruple to the ounce of water). The injected fluid must be introduced at one point about a line and a half or two lines from the cornea, whence it will flow round the cornea, surrounding it with an elevated ring like that of chemosis. This soon disappears. In five or six days, by which time the irritation from the injection will have disappeared, the cornea begins to clear from the margin. After three or four weeks the injection may be repeated; and after from three to five injections the formation of an artificial pupil has been practicable. (Prof. Rothmund, p. 186.)

DEAFNESS.—*Artificial Support in Certain Forms of.*—It is singular that the wetted cotton-wool of Yearsley, so useful in cases of loss of the membrana tympani, is sometimes useful in cases in which that membrane is entire. These cases are explainable by a disconection sometimes occurring between the ossicula. A number of specimens of this were exhibited by the late Mr. Toynbee at the meeting of the Royal Medico-Chirurgical Society in February, 1866. (Mr. E. Bishop, p. 191.)

Collapsed Membrana Tympani.—The simple procedure introduced by Politzer for inflating the tympanum affords a means of restoring a collapsed membrana tympani. The patient, being seated, takes a small mouthful of water, which he keeps in the mouth until at a signal given by the surgeon he swallows it. The surgeon, standing on his right side, introduces into the nostril of the side to be operated on a small flexible tube, and with his thumb

and fingers closes the nostrils over it. This tube may be connected either with an india-rubber bag, or with the surgeon's mouth; in either case he forces into it a sharp stream of air, at the moment when, at the given signal, the patient swallows. The air then rushes up the Eustachian tube (opened by the act of swallowing), and in the great majority of cases, especially in children, overcomes any obstruction that may exist. This condition of the tympanum is very common in children, and when detected, by examination with the speculum, may be treated with the greatest probability of a good result. In chronic cases of otorrhœa it is generally combined with perforation. (Mr. J. Hinton, p. 193.)

SIDE BLINDNESS.—*Operations on a Diseased Eye, the other Eye being Sound.*—The question often suggests itself to us in practice, whether it is advisable to operate on an eye for formation of artificial pupil, or for the cure of cataract, when the other eye is sound. As a general rule this may be answered in the affirmative. In making an artificial pupil it must not be made laterally, or double vision will result. (Mr. H. Walton, p. 181.)

SPRING SPECULUM FOR THE EYE.—The spring speculum in common use has been modified by bending it backwards towards the temple of the patient, so that it may not be in the way of the hand of an operator. (Prof. Graefe, p. 170.)

TARSAL OPTHHALMIA.—*Brown Citrine Ointment.*—Dr. Williams, of Cincinnati, recommends a brown citrine ointment, made by dissolving mercury in nitric acid, and adding the solution to cod-liver oil, until effervescence ceases and the mixture thickens. The first product is granular, but being kept over the fire and thoroughly melted, and then stirred until cold, a perfectly smooth, soft, homogeneous ointment, of a rich brown colour, is obtained. All crusts being first softened and removed from the eyelashes, the ointment should be gently applied to the tarsal margins with the pulp of the finger, in most cases every night. (Dr. E. Williams, p. 183.)

MIDWIFERY, AND THE DISEASES OF WOMEN, &c.

CHLOROSIS.—*Bismuth.*—There are individual constitutions so intolerant of iron, so peculiarly affected by it, that we are compelled altogether to forego the administration of this useful remedy. Some patients cannot endure it, except in quantities insufficient to effect a cure. We are in consequence compelled to look about for a substitute, and the most efficient one is probably bismuth. Under the use of this metal gradual and satisfactory cures have resulted. Carbonate of ammonia and the salts of Peruvian bark are also of value. (Sir Henry Marsh, p. 66.)

Effervescing Iron Powders.—The following formula is excellent:—Bicarbonate of soda, fifteen grains; tartaric acid, ten grains; dried sulphate of iron, from one to five grains; powdered white sugar, half a drachm. This powder should be kept in a dry place, dissolved in a wineglassful of water, and taken whilst effervescing. (Sir Henry Marsh, p. 67.)

ENDO-METRITIS.—*Intra-Uterine Scarification.*—In the absence of positive evidence, the frequency of endo-metritis may be inferred from the fact that a large proportion of patience refer their ill-health to pregnancy, labour, abortion, interrupted menstruation, &c., changes directly affecting the uterine mucous membrane. This state of inflammation may be treated by intra-uterine scarification. The means by which it is accomplished is Lallemand's urethrotome, modified by the addition of a probe-point, and an elevation two and a half inches from the point, as in Simpson's sound. It consists of a steel tube (slightly curved between the point and the elevation), fenestrated on one of its sides, in the distal end of which is an inclined plane. A knife, half an inch long and one-sixteenth wide, when pushed forward in the tube mounts on the inclined plane, and projects through the fenestra. (See fig., p. 233.) The mucous membrane may be easily and safely scarified by this instrument, the knife being drawn, steadied by the finger, the whole length

of the uterine cavity, and repeating this as many times as may seem necessary. Occasionally the operation is followed by a free flow of blood, but more commonly it is scanty, continuing for a couple of days, and corresponding in quantity to the usual amount of healthy menstruation for a similar period. The pain is slight, if the knife is sharp; but if dull, is proportionate to the degree of pressure requisite to make the incisions. (Dr. Erasmus D. Miller, p. 233.)

FIBROUS TUMOUR OF THE UTERUS.—*Slow Enucleation of, combined with Subsequent Avulsion*.—When enucleation of a fibrous tumour of the uterus is attempted, the final removal of the tumour is generally looked for too rapidly. Dr. Matthews Duncan recommends, and has adopted with success, the following plan of treatment. First dilate the os to sufficient size by sponge tents, when the upper part of the cavity of the cervix is not opened up as in the end of pregnancy. A sea-tangle tent may be used the first, but, sufficient dilatation cannot be produced by their means. When the tumour, or its lower part, is at or near the os uteri, the cervix being developed as in the end of pregnancy, the os should be opened by the knife or scissors in preference to tents. These operations are sometimes impossible without hooking the anterior lip of the uterus by a fine tenaculum, in order to steady and draw forward the os. The tenaculum must be held by an assistant. By a guarded knife the thin portion of uterus still covering the tumour must now be divided. The incision must vary in length and depth, according to the size of the tumour and the possibility of safe cutting without implicating neighbouring parts. This is not necessary while the tumour is still covered by uterine tissue. When this is done no further treatment is required for some time, and it will be found that the tumour is partially expelled by the contraction of the uterus. Little or no hemorrhage occurs during this time. After a time, when the tumour is partially removed by enucleation, its removal may be completely effected by avulsion—not rapidly, but gradually performed. The projecting portion of tumour must be seized with a strong volsella, and dragged and slightly twisted until removed. More than one pair of volsella are required, in order that when the operator feels his grasp yielding he may anew seize the tumour without its slipping back. (Dr. J. M. Duncan, p. 245.)

MAMMARY INFLAMMATION.—*Acute.*—In a case of acute inflammation of the breast, fifteen drops of tartar emetic wine (one-sixteenth of a grain) were ordered to be given in half a wineglassful of water every hour through the night, until eleven o'clock the next morning, a period of exactly twelve hours. Nothing local was applied except a piece of hot wet flannel, covered with oiled silk. By next morning the inflammatory hyperæmia was almost gone; the breast was only a little more swollen than the other, and there was scarcely any pain. It is curious that there was no appreciable nausea produced, nor indeed any other symptoms except a trifling diaphoresis. The medicine was given in the same quantity every two hours until the next day; then every four hours for another day; and in less than four days from the beginning of the treatment all signs of mammary inflammation had vanished. (M. J. K. Spender, p. 19.)

MAMMARY TUMOURS.—We must not rely too much upon *retraction of the nipple* as a diagnostic mark in cases of mammary tumour. This retraction is to be found under many different conditions; in the simple disease of the mamma, as well as in the malignant—in the inflammatory affections, as in others of a more morbid nature. Mr. Bryant gives some cases in support of this. In the first the breast appeared as a large globular tumour, of a firm consistence and a semifluctuating feel. The nipple was completely out of sight. The history of the case was that of inflammation, not running on to suppuration, and following a confinement nine months previously. After a time matter formed and was evacuated with relief. Nine months after treatment the breast was natural, but the nipple was still out of sight. Four somewhat similar cases are related. The same retracted state of nipple may occur in another simple disease of the breast, viz, cystic disease. In the first case related in support of this, the disease had existed four and a half years.

It began by a swelling at the outer side of the gland. The position of the nipple was only indicated by a deep depression. In real cancer retraction of the nipple does not by any means invariably occur. Out of 222 examples of cancer of the mamma, of which Mr. Bryant has notes, a retracted nipple existed in only 32 cases. It is a curious fact, that a nipple which has disappeared in the early stage of a cancer may reappear later in the case from pressure of the increasing mass. A retracted nipple may be described as an accidental symptom in the development of a tumour; it is the product of mechanical causes, and its presence is determined by the manner in which the gland is involved in the disease, rather than in the nature of the affection itself. Should any tumour attack the centre of the gland, a retracted nipple will ensue, from separation of the gland ducts, by which the extremities terminating in the nipple are drawn upon. (Mr. T. Bryant, p. 24.)

Midwifery Forceps.—*Improved Handle for.*—Dr. Inglis, Accoucheur to the Edinburgh New Town Dispensary, has introduced a modification of the handle of midwifery forceps, whereby more traction power is gained with a very short handle. A reference to the wood-cut at p. 320 will at once explain the instrument. No power of compression can be exercised, but Dr. Inglis says this is unnecessary with these forceps, traction by means of the horns of the handles being sufficient to keep the blades together. (Dr. A. Inglis, p. 223.)

More frequent use of the Forceps.—With proper care and undivided attention, the forceps are a most harmless, safe, and altogether admirable adjuvant in every-day obstetric practice. It is quite a wrong idea that we are bound to leave our patient to her own efforts till her safety is endangered. In so using them there must be no "fussiness," but it must be made light of, as if a matter of every-day occurrence. It is not always necessary to tell the patient what is going to be done. (Dr. J. Hardie, p. 225.)

Rupture of the Perineum from the use of the Forceps in Labour.—That the perineum is liable to be ruptured is one of the most frequent objections to the use of the forceps in labour. When the perineum is injured it is owing to the neglect of the precautions necessary to obviate it. The perineum must always be well supported, and great care must be taken to turn the handles of the forceps well over the pubic arch during extraction. On no account should traction be made in the long axis of the body in this stage (Dr. J. Hardie, p. 228.)

Ovariotomy.—There are only two ways of securing the pedicle successfully in cases of ovariotomy—the actual cautery, or by means of the silver wire suture. The actual cautery is not always successful; but we have always a safe and sure resource in the silver ligature. The changes which take place around the ligature are singular and somewhat unexpected. In the course of a very short time the ligature is grown over by the pedicle becoming embedded in its substance. No surgeon can expect to perform this operation successfully who is in the constant habit of making dissections or *post mortem* examinations, or of dressing erysipelatous or other poisonous wounds. (Dr. J. M. Sims, p. 253.)

Ligature of the Pedicle.—Mr. Bryant, of Guy's Hospital, has lately in seven cases of ovariotomy ligatured the pedicle in two portions and dropped it back into the abdomen, the ends of the ligatures having been cut off. One case only out of the seven proved fatal. (Mr. T. Bryant, p. 255.)

Polypus Uteri.—In some cases of polypus, where the vagina is narrow, and the uterus extremely rigid and completely filled by a very firm tumour, it is almost impossible to snare the growth with the chain of an ecraseur. Dr. Atthill, of Dublin, has had an ecraseur so modified (by Weiss) as to allow of the chain being passed round the growth by means of Gouch's canulæ, and of the canulæ then being passed the eye of the instrument and withdrawn, leaving the chain in its place in the ecraseur. (See wood-cut, p. 237.) This plan, we believe, will prove very useful. (Dr. L. Atthill, p. 235.)

Pruritus Pudendi.—*Sulphite of Soda.*—The following lotion is stated by Dr. Frizell, of Grangerbury, Ohio, to be a successful application in cases of

pruritus: Sodæ sulphitis ʒj, aquæ ʒiij, glycerinæ ℥j. It should be used frequently. (Dr. S. D. Frizell, p. 239.)

SELF RETAINING SPECULUM.—Dr. Bryant, of St. Louis, U. S., describes a modification of Sims' speculum which has the advantage of being self-retaining. The vaginal blade is the same as Sims', but attached to this by a hinge-joint is a longer one, which, by means of a lever with screws attached, can be made to fit tightly to the sacrum and back. (Dr. G. S. Bryant, p. 238.)

SEPTICÆMIA FROM THE LOCHIÆ.—*Hyposulphite of Soda.*—The disagreeable odour of the accouchement chamber caused by the peculiar smell of the lochiæ may be prevented by sprinkling the napkins with a solution of hyposulphite of soda. By this means a fruitful source of puerperal disease is avoided. (Dr. Constantine Paul, p. 262.)

SIMULATION OF PREGNANCY AND LABOUR BY HYDATIDS OF THE UTERUS.—A case is recorded by Mr. Ley, of South Molton, which should make us careful in giving medico-legal opinions in cases of supposed concealment of birth. It is also of importance as regards the question of pregnancy. The symptoms in no way during the supposed term of pregnancy led to the suspicion of the real state of the case. The patient stated that she felt the child move distinctly, and that she suffered much from morning sickness during the first four months. The breasts were enlarged, and the areolæ developed. In due time labour came on, attended with severe hemorrhage, and the accoucher thought the placenta was presenting. A large mass of hydatids was extracted—enough to nearly fill a large wash-hand basin. The secretion of milk came on copiously on the third day. Slight hemorrhage occurred twice within two months of the termination of the case. (Mr. R Ley, p. 229.)

STRICTURE OF THE CERVICAL CANAL OF THE UTERUS.—We must never think of attributing dysmenorrhœa and physical obstruction to the passage of the menses until we are quite sure that all inflammation and congestion have been removed by depleting the womb, by vaginal injections, and by the use of agents which, like nitrate of silver, substitute healthy for diseased nutrition of tissue. When all traces of inflammation have been removed, it is time to infer that dysmenorrhœa depends upon some obstruction to the free passage of the menses, and this can only be ascertained by probing the womb. For ordinary use nothing is better as a probe than the ordinary wax bougies; they are more easily passed than a resisting sound. (Dr. E. J. Tilt, p. 231.)

TURNING *versus* LONG FORCEPS IN CASES OF CONTRACTED PELVIC BRIM.—In cases where the conjugate diameter of the brim is moderately narrowed, so that in despite of good pains the head is arrested, there can be no doubt but that turning ought to be the rule, and the use of the long forceps the exception. It is astonishing in what unpromising cases the hand may be introduced and the head of the child made to recede. The principal recommendations of this plan are that it can be adopted earlier in the case than can the application of the forceps, and, consequently, with less danger to the mother, whose strength is not exhausted by the length of the case. Also, the soft hand of the accoucheur is a far safer instrument than the hard steel blades of the forceps. Even when the blades are applied and locked, the force required for extraction is often so great that it is a miracle for the soft parts to escape contusion and laceration. Out of 200 cases of this kind in which Dr. Ramsbotham, of London, attempted version, he only failed fourteen times, and it seems probable that even these would have been reduced in number had chloroform been used to overcome the force of the uterine contractions and to induce relaxation of parts. (Dr. A. Milne, p. 224.)

UTERINE AND RECTAL CANCER.—*Instrument for Injection of.*—The long, slender jet hitherto adapted to instruments for the purpose of injecting uterine and rectal cancer is very inefficient for the reason that it is difficult to avoid catching the point in the vagina or rectum, or puncturing the finger which serves to guide it to the part of the tumour intended to be injected and also

to ascertain how far the jet has penetrated. To avoid this, Mr. Ashton, of the Marylebone Infirmary, has invented an instrument which well answers the purpose desired. It will be understood at once from the woodcut at p. 23. (Mr. T.J. Ashton, p. 23.)

MISCELLANEA.

DISINFECTANTS.—Chlorine and chloride of lime should be preferred for the disinfection of sick rooms; carbolic acid and carbolate of lime for drains middens, and sewers; carbolic acid, chloride of zinc, or chloride of iron for evacuations; for stables and slaughterhouses, a mixed chloride and hypochlorite of zinc, which freely amalgamates with the liquid matters of the slaughterhouse without imparting unpleasant odours to the meat. (Dr. Letheby, p. 21.)

INGENIOUS BULLET DETECTOR.—Mr. Sylvan De Wilde has invented an ingenious bullet detector. It is a probe, consisting of two steel wires, insulated from each other, and connected with an electric horse-shoe magnet and a bell. If, when introduced into a wound, it touches a bullet, the circle is completed and the bell rings. He has also invented a forceps, which act on the same principle; they are intended first to detect, then to seize the bullet. (Mr. S. De Wilde, p. 276.)

IODIDE OF POTASSIUM.—It is well to combine iodide of potassium with carbonate of potash, in order to prevent iodine been set free in the stomach. (Dr. R. S. Sisson, p. 270.)

PRESERVATION OF MEAT BY SULPHUROUS ACID.—If meat be hung up in a chamber as air-tight as possible and filled with sulphurous acid by burning sulphur, all living germs are destroyed and decomposition does not take place. This might be of use in preserving meat for importation into this country. (Dr. James Dewar, *Medical Press and Circular*, *Oct.* 3, 1866, p. 340.)

PRUNUS VIRGINIANA.—The Prunus Virginiana, or American wild cherry, is a powerful tonic and calmative to the heart and arterial system. It has not the powerful effect of digitalis, but it is a valuable substitute for the latter when it is ill borne. Although not equal to it in the special relief which we need in extreme cases, Prunus Virginiana is a perfectly safe remedy. It is also useful in many cases of bronchitis, with feeble heart. (Dr. C. Allbutt, p. 258.)

TINCTURE OF PODOPHYLLIN.—The following formula is a good one: Podophyllum, one grain; spirits of wine, two drachms. Dissolve, and add tincture of hyoscyamus, two drachms. Dose: one drachm. When a stronger aperient is required, this tincture may be combined with a black draught. (Mr. F. W. Dunne, p. 262.)

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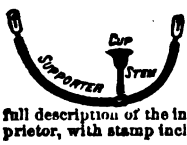

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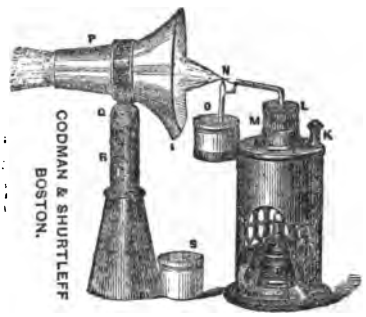

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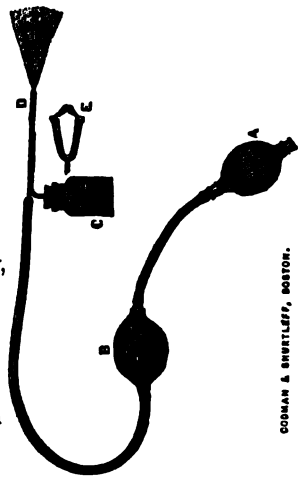

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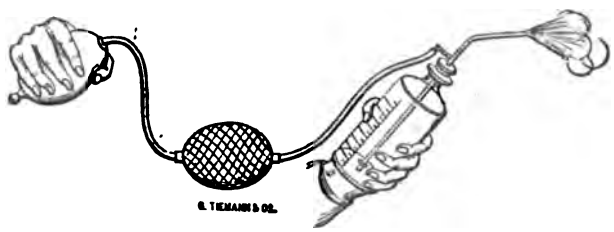

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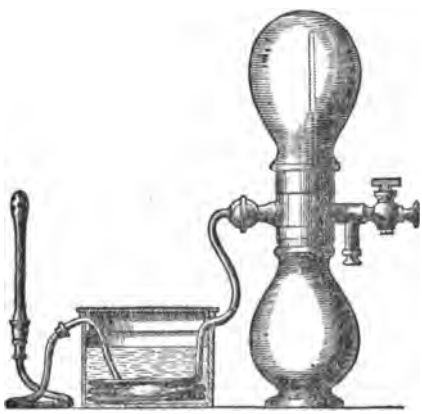

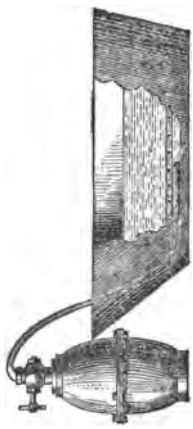

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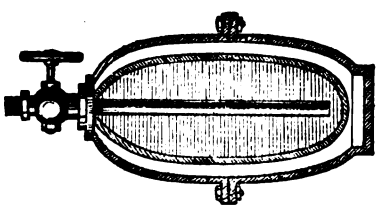

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Its Causes and Curative Treatment. With a Preliminary Statement of the Physiology of Generation. With numerous Colored and other Illustrations. By A. K. GARDNER, M. D., Fellow of the N. Y. Academy of Medicine, and late Instructor of Obstetrics and diseases of Females in the N. Y. Preparatory school of Medicine, &c., &c. In One Vol. Octavo. Price, $3.

This somewhat remarkable book has had quite a large sale; but few copies of it now remain in print, the plates having been recently destroyed by fire.

Copies of the above books will be sent, free of expense, on receipt of the marked price.

We shall shortly issue the following:

THE MORBID TUMORS. By Rudolph Virchow, Professor of Pathological Anatomy, General Pathology and Therapeutics; Director of the Pathological Institute; Director of La Charité, and Member of the Medical Deputation, etc., Berlin.

A MANUAL OF THE DISSECTION OF THE HUMAN BODY. By Luther Holden, F.R.C.S., Assistant Surgeon of and Lecturer on Anatomy at St. Bartholomew's Hospital. Illustrated with numerous wood engravings, with annotations by Dr. Erskine Mason.

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This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

The following are the principal objections urged against Sewing Machines:—

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2.—Liability to get out of order.
3.—Expense, trouble, and loss of time in repairing.
4.—Incapacity to sew every description of material.
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The Empire Sewing Machine is exempt from all these Objections.

It has a straight needle; perpendicular action; makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather to the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest number.

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Aloes, Comp. U. S. P. (Pil. Gent. Comp.)	50	2 25
Aloes et Assafœt. U. S. P.	40	1 75
Aloes et Ferri, [Pulv. Aloes Socot. ½ gr.; Pulv. Zingib. Jam. 1 gr.; Ferri Sulph. Exsic. 1 gr.; Ext. Conii ½ gr.]	40	1 75
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Ammon. Bromid. 1 gr.	75	3 50
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Antimonii Comp. U. S. P. (See Pil. Cal. Comp.)	40	1 75
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Assafœtida, 2 gr.	40	1 75
Assafœtida Comp. [Assafœtida, 2 gr.; Ferri Sulph. Exsic. 1 gr.]	40	1 75
Assafœtida et Rhei. [Assafœtida 1 gr.; Pulv. Rhei, 1 gr.; Ferrum per Hydrog. 1 gr]	75	3 50
Bismuth, Subnit. 3 gr.	75	3 50
Bismuth, Subcarb. 3 gr.	75	3 50
Calomel, ½ gr.	40	1 75
Calomel, 1 gr.	40	1 75
Calomel, 2 grs.	40	1 75
Calomel, 3 grs.	40	1 75
Calomel, 5 grs.	50	2 25
Calomel Comp. (Plum'rs), 3 grs. [Calomel, Oxysulp. Antmy.; Guaiacum Resin.]	40	1 75
Calomel et Opii, [Calomel. 2 gr.; Opium, 1 gr.]	85	4 00
Calomel et Rhei, [Calomel. ½ gr.; Ext. Rhei, ½ gr.; Ext. Coloc. C. ½ gr.; Ext. Hyoscyam 1-6 gr.	75	3 50
Cathart. Comp. U. S. P. [Ext. Coloc. Comp. 1½ gr.; Ext. Jalapæ, 1 gr.; Calomel, 1 gr.; Pulv. Gambogiæ, 2-9 grs.]	75	3 50
Chapman's Dinner Pills. [Pulv. Aloe Soc.; Pulv. Rhei Opt.; Gum Mastich]	60	2 75
Cerii Oxalat. 1 gr.	1 00	4 75
Chinoidin. Comp. [Chinoidin, 2 grs.; Ferri Sulph. Exsic. 1 gr.; Piperini, ½ gr.]	1 00	4 75
Cinchon. Sulph. 1½ gr.	75	3 50
Cook's, 3 gr. [Pulv. Aloes Soc. 1 gr.; Pulv. Rhei, 1 gr.; Calomel, ½ gr.; Sapon. Hispan. ½ gr.]	50	2 25
Coloc. Comp. 3 gr. [Ext. Coloc. Comp. U. S. P.]	80	3 75
Colocynth. et Hydrarg. et Ipecac.	75	3 50
Copaibæ, U. S. P., 3 gr.	50	2 25
Copaibæ et Ext. Cubebæ. [Pil. Copaibæ, 3 grs.; Oleo-res. Cub. 1 gr.	80	3 75
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Diuretic. [Sapo Hispan. Pulv. 2 grs.; Sodæ Carb. Exsic. 2 grs.; Ol. Baccæ Junip. 1 drop]	50	2 25
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Fel. Bovinum. [Ox gall, 2 gr.; Pow'd Jamaica Ginger, 1 gr.]	50	2 25
Ferri (Quevenne's), 1 gr.	50	2 25
Ferri (Quevenne's), 2 grs.	75	3 50
Ferri Carb. (Valett's) U. S. P. 3 grs.	40	1 75
Ferri Citrat. 2 grs.	50	2 25
Ferri Comp. U. S. P.	40	1 75
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Ferri Iodid. 1 gr.	65	3 00
Ferri Lactat. 1 gr.	50	2 25
Ferri Pyrophosph. 1 gr.	40	1 75
Ferri Sulph. Exsiccat. 2 grs.	40	1 75
Ferri Valer. 1 gr.	1 00	4 75
Ferri et Quass. et Nuc. Vom. [Fer. per Hydrogen, 1½ gr.; Ext. Quassiæ, 1 gr.; Ext. Nuc. Vom. ½ gr.; Pulv. Saponis, ½ gr.]	75	3 50
Ferri et Quin. Cit. 1 gr.	75	3 50
Ferri et Quin. Cit. 2 grs.	1 40	6 75
Ferri et Strychniæ [Strychniæ. 1-60 gr.; Ferr. pr. Hydr. (Quevenne's) 2 grs.	75	3 50
Ferri et Strych. Cit. [Strych. Cit. 1-50 gr.; Ferri Cit. 1 gr.]	75	3 50
Galbani Comp. U. S. P. [Galbanum, 1½ gr.; Pulv. Myrrh. 1½ gr.; Assafœtida, 1½ gr.]	50	2 25
bogiæ Comp. U. S. P.	40	1 75
Comp. [Ext. Gent. ½ gr.; Aloe Socot. ½ gr.; v. Rhei. 1½ gr.; Ol. Carui, 1-5 gr.]	50	2 25

PILLS.	Price per bot. of 100 each.	500 each.
paib. Solid. 1 gr.; Ferri Sulph. Exsic. ½ gr.; Terebinth. Venet. 1½ gr.]	$0 60	$2 75
Hepatica, [Pil Hydrarg. 3 gr.; Ext. Coloc. Comp. 1 gr.; Ext. Hyoscyam. 1 gr.]	90	4 25
Hooper (Female Pills), 2½ gr. (See U. S. Disp.)	40	1 75
Hydrargyri, U. S. P. 3 gr.	40	1 75
Hydrargyri, 5 gr.	50	2 25
Hydrargyri, Comp. [Mass. Hydrarg. 1 gr.; Pulv. Opii, ½ gr.; Pulv. Ipecac. ½ gr.]	80	3 75
Hydrargyri, Iod. et Opii (Ricord's). [Hydg. Iodid. 1 gr.; Pulv. Opii, ½ gr.]	75	3 50
Iodoform et Ferri. [Ferrum per Hydro. 1 gr.; Iodoform, 1 gr.	3 50	17 25
Ipecac. et Opii, 2½ gr. (Pulv. Doveri, U. S. P.)	50	2 25
Leptand. Comp. [Leptandrin, 1 gr.; Irisin, ½ gr.; Podophyllin, ½ gr.]	1 00	4 75
Lupulin, 3 gr.	40	1 75
Magnesiæ et Rhei (1 gr. each)	40	1 75
Morphiæ Comp. [Morph. Sulph. ½ gr.; Ant. et Pot. Tart. ½ gr.; Calomel, ½ gr.]	1 50	7 25
Opii, U. S. P. 1 gr.	80	3 75
Opii et Camphoræ, [Pulv. Opii, 1 gr.; Camphoræ, 2 gr.]	90	4 25
Opii et Camph. et Tannin, [Pulv. Opii, ½ gr.; Camphoræ, 1 gr.; Acid. Tannic. 2 gr.]	90	4 25
Opii et Plumbi Acet. [Pulv. Opii, ½ gr.; Plumbi Acet. 1½ gr.]	80	3 75
Podophyllin et Hydrarg. [Podophyllin, ½ gr.; Pil. Hydrarg. 2 gr.]	50	2 25
Potass Bromid. 1 gr.	75	3 50
Potass. Iodid. 2 grs.	85	4 00
Quiniæ Sulph. ½ gr.	1 00	4 75
Quiniæ Sulph. 1 gr.	1 60	7 75
Quiniæ Sulph. 2 grs.	3 10	15 25
Quiniæ Comp. [Quin. Sulph. 1 gr.; Ferr. pr Hydg. (Quevenne's) 1 gr.; Acid Arsenious, 1-60 gr.]	1 90	9 25
Quiniæ et Ext. Belladon. [Quiniæ Sulph. 1 gr.; Ext. Belladon. ½ gr.]	1 90	9 25
Quiniæ et Ferri. [Quin. Sulph. 1 gr. Ferr. pr. Hydg. (Quevenne's) 1 gr.]	1 90	9 25
Quiniæ et Ferri et Strychniæ. [Quin. Sulph. 1 gr.; Ferri Carb. (Valett's) 2 grs.; Strych. Sulph. 1-60 gr.]	1 90	9 25
Quiniæ et Ferri et Valer. 2 grs.	3 50	17 25
Rhei. U. S. P.	75	3 50
Rhei Comp. U. S. P.	75	3 50
Rheumatic. Ext. Coloc. C. 1½ gr.; Ext. Colchici Acet. 1 gr.; Ext. Hyoscyam. ½ gr.; Hydg. Chlor. Mit. ½ gr.]	90	4 25
Santonin, 1 gr.	1 00	4 75
Scillæ Comp. U. S. P.	50	2 25
Stomachic. (Lady Webster's Dinner Pills), 3 gr. [Pulv. Aloes Socot.; Gum Mastich; Flor. Rosæ]	50	2 25
Zinci Valerian. 1 gr.	1 00	4 75

GRANULES.

Acid. Arsenious, 1-20 gr.	40	1 75
Acid. Arsenious, 1-50 gr.	40	1 75
Aconitia, 1-60 gr.	75	3 50
Atropia, 1-60 gr.	75	3 50
Corrosive Sublimate, 1-12 gr.	40	1 75
Corrosive Sublimate, 1-20 gr.	40	1 75
Digitalin, 1-60 gr.	75	3 50
Elaterium (Clutterbuck's), 1-10 gr.	1 00	4 75
Extract Belladonna (English), ½ gr.	40	1 75
Extract Cannabis Indica, ½ gr.	60	2 75
Extract Hyoscyamus (English), ½ gr.	40	1 75
Extract Nux Vomica, ½ gr.	40	1 75
Mercury Iodide, ½ gr.	40	1 75
Mercury Iodide, Red, 1-16 gr.	40	1 75
Morphiæ Acet. ½ gr.	85	4 00
Morphiæ Sulphate, 1-10 gr.	70	3 25
Morphiæ Sulphate, ½ gr.	85	4 00
Morphiæ Sulphate 1-6 gr.	1 00	4 75
Morphiæ Valerianate, ½ gr.	1 00	4 75
Podophyllin, ½ gr.	40	1 75
Podophyllin, ½ gr.	50	2 25
Potass. Permangan. Cryst. ½ gr.	50	2 25
Quinia Valerianate, ½ gr.	2 00	9 75
Silver Nitrate, ½ gr.	75	3 50
Strychnia, 1-20 gr.	40	1 75
Strychnia, 1-40 gr.	40	1 75
Strychnia, 1-60 gr.	40	1 75

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FLUID EXTRACTS.

One Fluidounce of these Extracts represent one Troyounce of the material from which they are made, and are very desirable for making **Tinctures, Wines and Syrups**; by using one Fluidounce of the Extract where one Troyounce of the crude material is ordered, making up the measure with alcohol of proper strength for Tinctures, and Wine and Syrup Simplex for the others. Which makes, in a very short time, a preparation in all cases as good, and in very many cases BETTER, at a less cost, and with comparatively no labor.

The only exceptions to this rule are the Fluid Extracts of Cinchona Calisaya, and Wild Cherry, of which two Fluidounces represent one Troyounce, as directed in the U. S. Pharmacopœia.

		DOSES.	1 lb. bottles.	4 oz. bottles.
ACHILLEA,	Yarrow,	One half to one fluidrachm,	1 00	35
ACONITE FOL.		One to two minims,	1 40	45
" RAD.		Two to four minims,	1 50	48
ANTHEMIS,	Chamomile Flowers,	One half to one fluidrachm,	1 50	48
APOCYNUM ANDROSEMIFOLIUM,	Bitter Root,	Ten to twenty minims,	1 50	48
" CANNABINUM,	Indian Hemp,	Ten to thirty minims,	1 50	48
ARALIA HISPIDA,	Dwarf Elder,	One half to one fluidrachm,	1 65	52
" RACEMOSA,	Spikenard,	One half to one fluidrachm,	1 25	40
ARNICA FLOR.		Five to ten minims,	1 10	38
ARTEMISIA ABSINTHIUM,	Wormwood,	Twenty to forty minims,	1 10	38
ASCLEPIAS TUBEROSA,	Pleurisy Root,	One half to one fluidrachm,	1 50	48
AURANTIUM,	Bitter Orange Peel,	One half to one fluidrachm,	1 40	45
BAYBERRY,		Twenty to thirty minims,	1 10	38
BELLADONNA,		One to two minims,	1 65	52
BUCHU,		Twenty to thirty minims,	1 80	56
" COMP.		One to three fluidrachms,	1 80	56
" ET PAREIRA BRAVA,		One half to one fluidrachm,	1 80	56
CANNABIS INDICA,	Indian Hemp, [foreign,]	Two to five minims,	3 00	88
CAPSICUM,	Bird Pepper,	One to five minims,	2 25	65
CARDUUS BENEDICTUS,	Blessed Thistle,	One half to one fluidrachm,	1 65	52
CASCARILLA,		Twenty to forty minims,	1 00	35
CAULOPHYLLUM,	Blue Cohosh,	Ten to twenty minims,	1 25	40
CINCHONA CALISAYA, U. S. P.		One to two fluidrachms,	2 75	80
" RUBRA,		One half to one fluidrachm,	4 10	1 20
" COMP.		Twenty to forty minims,	3 60	1 00
CHELIDONIUM,	Garden Celandine,	One half to one fluidrachm,	1 25	40
CHIMAPHILA,	Pipsissewa,	One to two fluidrachms,	1 10	38
CHIRETTA,		Twenty to thirty minims,	3 25	95
CIMICIFUGA,	Black Snakeroot,	One half to one fluidrachm,	1 20	40
COLCHICI RAD.	Colchicum Root,	Two to eight minims	1 50	48
" SEM.	Colchicum Seed,	Two to eight minims	2 25	65
COLOCYNTH,		Five to ten minims,	2 25	65
COLUMBO,		Ten to thirty minims,	1 75	55
CONIUM,		Three to five minims,	1 50	48
CORIANDER SEED,		One half to one fluidrachm,	1 50	48
CORNUS FLOR.	Dogwood Bark,	One half to one fluidrachm,	1 10	38
CORYDALIS,	Turkey Corn,	Five to twenty minims,	3 25	95
CUBEBA ALC.		One half to one fluidrachm,	2 50	75
" ETHEREAL,		Five to thirty minims,	7 75	2 25
CYPRIPEDIUM,	Ladies Slipper,	Ten to twenty minims,	2 00	60
DIGITALIS,	Foxglove,	One to two minims,	1 40	42
DULCAMARA,	Bittersweet,	One half to one fluidrachm,	1 10	38
ERGOTA,		Ten to twenty minims,	3 00	88
ERIGERON CANADENSE,	Canada Fleabane,	One half to one fluidrachm,	1 10	38
EUONYMUS,	Wahoo,	Twenty to thirty minims,	1 65	52
EUPATORIUM PERFOL.	Boneset,	Ten to twenty minims,	1 10	38
" PURPUR.	Queen of Meadow,	Twenty to thirty minims,	1 10	38
GELSEMINUM,	Yellow Jessamine,	Two to ten minims,	2 75	80
GENTIAN,		Ten to thirty minims,	1 00	35
" COMP.		Ten to twenty minims,	1 35	44
GERANIUM,	Cranesbill,	Twenty to thirty minims,	1 50	48
GLYCYRRHIZA RAD.,	Liquorice Root,	One to two fluidrachms,	1 10	38
GOSSYPIUM,	Cotton Root Bark,	One to two fluidrachms,	3 00	88
HAMAMELIS VIRG.	Witch Hazel.	One to two fluidrachms.	1 00	35

FLUID EXTRACTS, CONTINUED.

		DOSES.	1 lb bottles.	4 oz. bottles.
IUMULUS,	Hops,	Twenty to thirty minims,	1 50	48
IYDRANGEA,		Twenty to thirty minims,	1 35	44
IYDRASTIS CANADENSIS,	Golden Seal,	Ten to thirty minims,	1 75	55
IYOSCIAMUS,	Henbane,	Five to ten minims,	1 75	55
GNATIA AMARA,	St. Ignatius Bean,	Three to five minims,	2 75	80
NULA,	Elecampane,	One half to one fluidrachm,	85	30
PECACUANHA,		Two to twenty minims,	8 75	2 40
RIS VERSICOLOR,	Blue Flag,	Five to twenty minims,	1 40	45
ALAP,		Fifteen to thirty minims,	5 50	1 60
UGLANDIS,	Butternut Bark,	One to two fluidrachms,	1 00	35
RAMERIA,	Rhatany,	Twenty to thirty minims,	1 50	48
ACTUCA SATIVA,	Garden Lettuce,	Five to twenty minims,	1 20	40
APPA,	Burdock,	One half to one fluidrachm,	1 10	38
UPULINE,		Five to ten minims,	3 25	95
IFE EVERLASTING,		One half to one fluidrachm,	1 40	45
EPTANDRA,	Blackroot,	One half to one fluidrachm,	1 50	48
OBELIA,		Five to forty minims,	2 25	65
" COMPOUND,		Ten to forty minims,	2 25	65
ARRUBIUM,	Horehound,	One half to one fluidrachm,	1 20	40
EZERION BARK,		Five to ten minims,	2 00	60
UX VOMICA,		Five to ten minims,	1 65	52
PIUM AQUEOUS,		Five to ten minims,	2 50	75
APAVERIS,	Poppies,	One to two fluidrachms,	1 50	48
AREIRA BRAVA,		One half to two fluidrachms,	1 50	48
HYTOLACCA,	Pokeroot,	Three to thirty minims,	1 10	38
IPER NIGRUM,	Black Pepper,	Five to twenty minims,	1 40	45
ODOPHYLLUM,	May Apple Root,	Twenty to thirty minims,	1 25	40
OPULUS BALSAMIFERA,	Poplar Bark,	One half to one fluidrachm,	1 00	35
RUNUS VIRGINIANA,	Wild Cherry Bark,	One fluid drachm,	95	33
UASSIA,		Five to twenty minims,	85	30
UERCUS ALBA,	White Oak Bark,	One half to one fluidrachm,	1 10	38
HAMNUS CATHART,	Buckthorn Berries,	One half to one fluidrachm,	1 40	45
HEI,	Rhubarb,	Twenty to thirty minims,	5 50	1 60
" AROMAT,		Twenty to thirty minims,	5 50	1 60
" ET POTASSA,		One to two fluidrachms,	5 50	1 60
" ET SENNA,		One half to one fluidrachm,	3 25	95
HUS GLABRUM,	Sumac berries,	One half to one fluidrachm,	85	30
UBUS VILLOSUS,	Blackberry Root,	Twenty to thirty minims,	1 10	38
UMEX CRISPUS,	Yellow Dock,	One to four fluidrachms,	1 35	44
ABINA FOL.	Savine Leaves,	Five to fifteen minims,	1 10	38
AMBUCUS,	Elder Flowers,	One to two fluidrachms,	1 75	55
ANGUINARIA,	Bloodroot,	Three to twenty minims,	1 35	44
ARSAPARILLA,		One half to one fluidrachm,	1 40	45
" COMP.		One half to one fluidrachm,	1 40	45
" " for making,			1 40	45
yrup Sarsap. Comp., U.S.P.				
ASSAFRAS,		One half to one fluidrachm,	1 40	45
ILLÆ,	Squills,	Two to ten minims,	1 10	38
" ET SENEGA,		Five to fifteen minims,	1 90	58
UTELLARIA,	Scullcap,	One half to one fluidrachm,	1 40	45
ENEGA,		Ten to twenty minims,	2 25	65
NECIO,	Liferoot,	One half to one fluidrachm,	1 40	45
NNA,		One to two fluidrachms,	1 00	35
" ET JALAP,		One half to one fluidrachm,	2 25	65
RPENTARIA,	Virginia Snake Root,	Ten to thirty minims,	3 00	88
IGELIA,	Pinkroot,	One to two fluidrachms,	1 90	58
" ET SENNA,	" and senna,	Two to four fluidrachms,	1 65	52
ILLINGIA,	Queensroot,	Two to ten minims,	2 75	80
" COMP.		Ten minims to one fluidrm.	2 50	75
RAMONII FOL.		Two to four minims,	1 25	40
MPHYTUM,	Comfrey,	One to two fluidrachms,	1 25	40
MPLOCARPUS,	Skunk Cabbage Root,	Ten to forty minims,	1 10	38
NACETUM,	Tansy,	One half to one fluidrachm,	1 10	38
RAXACUM,	Dandelion,	Two to four fluid drachms,	1 35	44
A URSI,		One half to one fluidrachm,	1 00	35
LERIAN, ENGLISH,		One half to one fluidrachm,	1 75	55
" GERMAN,		One half to one fluidrachm,	1 50	48
RATRUM ALBUM,	White Hellebore,	Two to twenty minims,	1 65	52
" VIRIDE,	American Hellebore,	Two to four minims,	1 65	52
NTHOXYLUM,	Prickly Ash Bark,	Ten to thirty minims,	1 25	40
"	Prickly Ash Berries,	One half to one fluidrachm,	1 65	52
NGIBERIS,	Jamaica Ginger,	Ten to thirty minims,	1 65	52

SOLID EXTRACTS.

		DOSES.	1 lb. jars.	4 oz. jars.	1 oz. jars.
ACHILLEA,	Yarrow,	Five to fifteen grains,	3 25	95	30
ACONITE FOL.		One half to one gr.	2 75	82	28
ALOES SOCOT.		Five to fifteen grs.	3 00	90	30
ANTHEMIS FLOR.	Chamomile Flowers,	Ten to twenty grs.	2 50	75	25
APOCYNUM ANDROSEMIFOLIUM,	Bitter Root,	One to ten grains,	4 50	1 30	40
ARNICA FLOR.		Five to ten grains,	2 75	82	28
ARTEM. ABSYNTH.	Wormwood,	Five to ten grains,	2 75	82	28
BAYBERRY,		Five to ten grains,	2 75	82	28
BELLADONNA,		One half to one grain,	4 75	1 35	42
BUCHU.		Five to ten grains,	6 25	1 75	50
CANNABIS INDICA,	Indian Hemp, foreign,	One to two grains,			1 65
" " pure resin,		One half to one grain,			3 00
CASCARILLA,		Three to ten grains,	3 50	1 00	32
CIMICIFUGA,	Black Snakeroot,	Three to ten grains,	2 75	82	28
CINCHONA, Calisaya,		Ten to thirty grains,	13 00	3 50	1 00
" Pallida,		Twenty to sixty grs.	6 00	1 70	50
" Rubra,		Ten to thirty grains,	13 00	3 50	1 00
COLCHICI, Acet,		One to two grains,	4 50	1 30	40
COLOCYNTH,		One to five grains,	7 75	2 15	60
" Pulv.		One to five grains,	10 50	2 85	80
" Comp.		Five to thirty grains,	5 25	1 50	45
" " Pulverized,		Five to thirty grains,	6 25	1 75	50
" " U. S. P., Pulv.		Five to thirty grains,	9 00	2 45	70
COLOMBO,		Five to fifteen grains,	5 00	1 40	42
CONIUM,		One to two grains,	2 75	82	28
CUBEBA, Ethereal,		Five to fifteen grains,	7 75	2 15	60
CYPRIPEDIUM,	Ladies Slipper,	One to five grains,	4 75	1 35	42
DIGITALIS,	Foxglove,	One fourth to half gr.	3 25	95	30
DULCAMARA,	Bittersweet,	Five to ten grains,	3 00	90	30
EUPATORIUM PERFOL.	Boneset,	One to ten grains,	2 75	82	28
GALLÆ,		Five to ten grains,	2 50	75	25
GENTIAN,		Ten to thirty grains,	80	31	15
HELLEBOR NIG.	Black Hellebore,	Three to ten grains,	3 60	1 05	32
HUMULUS.	Hops,	Ten to thirty grains,	3 60	1 05	32
HYDRASTIS CANADENSIS,	Golden Seal,	Two to five grains,	4 50	1 30	40
HYOSCIAMUS,	Henbane,	One to two grains,	4 75	1 35	42
IGNATIA AMARA,	St. Ignatius Bean,	One half to one grain,			1 30
INULA,	Elecampane,	One to ten grains,	3 25	95	30
IRIS VERSICOLOR,	Blue Flag Root,	One fourth to one gr.	3 25	95	30
JALAP,		Ten to twenty grains,	11 50	3 15	88
" Pulverized,		Ten to twenty grains,	13 75	3 75	1 05
JUGLANDIS,	Butternut Bark,	Twenty to thirty grs.	1 65	55	20
KRAMERIA, Dry,	Rhatany Root,	Ten to twenty grains,	5 25	1 50	45
LEPTANDRA,	Blackroot,	One to ten grains,	3 25	95	30
LOBELIA,		One to five grains,	4 25	1 20	38
MALEFERN,		Twenty to forty grains,	3 50	1 00	32
NUX VOMICA,		One half to two grains,			80
" " Powd.		One half to two grains,			1 15
OPII ACET,		One fourth to one half gr.			2 30
" AQ.		One fourth to one half gr.			2 30
PAPAVERIS,	Poppies,	Three to ten grains,	4 60	1 30	40
PAREIRA BRAVA,		Three to ten grains,			1 00
PHYTOLACCA,	Pokeroot,	One to five grains,	3 25	95	30
PODOPHYLLI,	May Apple Root,	Five to fifteen grains,	2 75	82	28
QUASSIA,		Three to five grains,	3 25	95	30
RHEI,	Rhubarb Root,	Ten to thirty grains,	11 00	3 00	85
SABINA,	Savine Leaves,	One to five grains,	3 75	1 05	35
SANGUINARIA,	Bloodroot,	One fourth to one gr.	3 50	1 00	32
SARSAPARILLA,		Five to twenty grs.	5 00	1 40	42
" Comp.		Five to twenty grs.	3 25	95	30
SENEGA,		One to three grains,	6 00	1 70	50
SENNA ALEX.		Five to fifteen grs.	2 25	70	25
MONIUM FOL.		One half to one grain,	2 75	82	28
ACUM,		One half to one dr'm,	1 65	55	20
SI,		Five to fifteen grains,	2 50	75	25
AN, English,		Three to ten grains,	4 50	1 30	40

SPREAD PLASTERS.

In boxes of one dozen.

		dozen.
ARNICA,	No. 1	2 00
"	" 2	1 56
"	" 3	1 35
BELLADONNA,	" 1	2 40
"	" 2	1 85
"	" 3	1 45
BURGUNDY PITCH,	" 1	2 00
" "	" 2	1 56
" "	" 3	1 35
GALBANUM,	" 1	2 40
"	" 2	1 85
"	" 3	1 45
HEMLOCK,	" 1	2 00
"	" 2	1 56
"	" 3	1 35
POOR MAN'S, on Canvas,	" 2	1 10
" " on Kid,	" 2	1 45
" " on Paper,	" 2	60
RHEUMATIC and STRENGTH'G,	" 1	2 00
" "	" 2	1 56
" "	" 3	1 35
STRENGTHENING,	" 1	2 00
"	" 2	1 56
"	" 3	1 35
" on Canvas	" 2	1 35
WARMING,	" 1	2 00
"	" 2	1 56
"	" 3	1 35

ADHESIVE PLASTER, CLOTH,		
5 and 10 yard rolls,	per yard	30
1 yard rolls	per dozen,	3 00
2 "	"	4 50

PLASTERS IN HALF POUND ROLLS.

		lb.
ACONITE,		1 40
ADHESIVE,		" 45
" FORT.		" 50
AMMONIAC,		" 1 10
" C. CICUTA,		" 1 90
" C. HYDRARG.		" 1 40
ANODYNE,		" 2 75
ARNICA,		" 1 40
AROMATIC,		" 1 65
ASSAFŒTIDA,		" 95
BELLADONNA,		" 1 65
CALEFACIENS,		" 68
CANTHARIDES,		" 1 40
CICUTA,		" 1 10
DIAPALMA,		" 68
GALBANUM,		" 85
" COMP.		" 60
GUAIACUM,		" 85
HYDRARG. FORT.		" 1 40
" MIT.		" 1 10
HYOSCIAMUS,		" 1 65
LOGAN,		" 55
MYRRH,		" 80
OLIVAR,		" 45
OPIUM,		" 3 00
OXYCROCEUM,		" 56
PLUMBI,		" 45
" C. GUM,		" 50
" BROWN,		" 50
ROBORANS,		" 45
SAPONIS,		" 56
SIMPLEX,		" 56
DE VIGO C. MERCURIO,		" 1 90

SUGAR COATED PILLS AND GRANULES.

	DOSES.	bottles of 100 pills.	bottles of 500 pills
ALOES, U. S. P. { Pulv. Aloes Socot: 2 grs. / " Saponis 2 grs. }	Two to five pills,	31	1 35
" Comp. U.S.P. [Pil: Gent: Comp:]	One to five pills,	38	1 70
ALOES ET ASSAFŒT: U.S.P. { Pulv: Aloes Socot: 1 1-3 grs. / Assafoetida, 1 1-3 grs. / Pulv: Saponis 1 1-3 grs. }	Two to five pills,	31	1 35
ALOES ET FERRI, { Pulv: Aloes Socot: ½ gr. / " Zingib: Jam: 1 gr. / Ferri Sulph: Exsic: 1 gr. / Ext: Conii ½ gr. }	One to three pills,	31	1 35
ALOES ET MASTICH: [See Pil: Stomachicae]	One to two pills,	38	1 70
ALOES ET MYRRHÆ, U.S.P. { Pulv: Aloes Socot: 2 grs / " Myrrhæ 1 gr / Croci Stigmat: ½ gr }	Three to six pills,	38	1 70
ALTERATIVE { Mass Hydrargyri 1 gr / Pulv: Opii 1-8 gr / Pulv: Ipecac 1-8 gr }	One to four pills,	38	1 70
AMMON BROMID: 1 gr	Two to six pills,	58	2 70
ANDERSON'S SCOTS, { Pulv: Aloes Socot: / " Sapon: Hispan: / " Fruct: Colocynth: / " Gambogiæ / Oleum Anisi }	Two to four pills,	31	1 35
" " plain, in boxes, per doz	90 cts		
ANTI-BILIOUS, Vegetable, { Pulv: Ext: Coloc: C. 2½ gr / Podophyllin ½ gr }	One to two pills,	58	2 70
ANTIMONII Comp: U.S.P. [See Pil: Calomel Comp:]	One to three pills,	31	1 35
APERIENT, { Ext: Nuc: Vom: ½ gr / " Hyosciam: ½ gr / " Coloc: C. 2 gr }	One to three pills,	70	3 20
ASSAFŒTIDA, U. S. P.	One to four pills,	31	
" 2 gr	Two to six pills,	31	
" Comp: { Assafœtida 2 gr. / Ferri Sulph: Exsic: 1 gr }	One to three pills,	38	

THOMAS & TWINING, PHILADELPHIA.

SUGAR COATED PILLS, CONTINUED.

	DOSES.	bottles of 100 pills.	bottles of 500 pills.
SMUTH and NUX VOM: { Bismuth: Subnit: 5 gr; Ext: Nux Vom: ½ gr }	One to two pills,	1 15	5 25
LOMEL, ½ gr	One to six pills,	31	1 35
" 1 gr	One to six pills,	31	1 35
" 2 gr	One to six pills,	31	1 35
" 3 gr	One to four pills,	31	1 35
" 5 gr	One to three pills,	38	1 70
" Comp: [Plummer's] 3 grs { Calomel: Oxysulph Antimony Guaiacum Resin, }	One to three pills,	31	1 35
" et Opii, { Calomel 2 grs; Opium 1 gr }	One to two pills,	65	3 05
" et Rhei { Calomel 1-3 gr; Ext: Rhei ½ gr; " Coloc: C. ½ gr; " Hyosciam: 1-6 gr }	One to four pills,	58	2 70
THART: COMP: U. S. P. { Ext: Coloc: Comp: 1 1-3 grs; " Jalapæ 1 gr; Calomel: 1 gr; Pulv: Gambogiæ, 2-9 gr }	Three pills,	58	2 70
" "	per lb.	$7 00	
" " plain	"	7 75	
THART: COMP: [vegetable] { Podophyllin, Ext: Colocynth: Pulv: Aloe Socot: " Scammon: Virg: " Saponis " Cardamomi: }	Two to four pills,	58	2 70
APMANS DINNER PILLS, { Pulv: Aloe Soc: " Rhei Opt: Gum Mastich }	One to two pills,	45	2 10
RII OXALAT: 1 gr	One to two pills,	78	3 60
INOIDIN, 2 gr	One to four pills,	38	1 70
INOIDIN: COMP: { Chinoidin: 2 grs; Ferri Sulph: Exsic 1 gr; Oleo-resin Pip: Nig: ½ gr }	One to four pills,	78	3 50
TCHON: SULPH: 1½ gr	One to two pills,	58	2 70
DK'S, 3 grs { Pulv: Aloes Soc: 1 gr; " Rhei 1 gr; Calomel ½ gr; Sapon Hispan ½ gr }	Two to four pills,	38	1 70
LOCYNTHIDIS Comp: 3 gr. [Ext: Coloc: Comp: U.S.P.]	Two to four pills,	62	2 80
LOCYNTH: ET HYDRARG: ET IPECAC: { Pulv: Ext: Coloc: Comp: 2 gr; Pil: Hydrarg: 2 gr; Pulv: Ipecac 1-6 gr }	One to three pills,	58	2 70
PAIBÆ, U. S. P. 3 gr	Three to six pills,	38	1 70
" et Ext: Cubebæ { Pil: Copaibæ 3 gr; Oleo Resin: Cubebæ 1 gr }	Two to four pills,	62	2 80
PAIB: COMP: { Pil: Copaib: Resin: Guaiac: Ferri Cit: Oleo-resin Cubeb: }	One to four pills,	62	2 80
JRETIC: { Sapo Hispan: Pulv: 2 grs; Sodæ Carb: Exsic: 2 grs; Ol: Baccæ Junip: 1 drop }	One to four pills,	38	1 70
PUYTREN { Pulv: Guaiac: 3 grs; Hydg: Chlor: Corros: 1-10 gr; Pulv: Opii 1-8 gr }	One to three pills,	38	1 70
MENAGOGUE [Mutter] { Ferri Sulph: 1½ gr; Aloe Socot: Pulv: ½ gr; Terebinth: Alb: 1½ gr }	One to three pills,	38	1 35
: BOVINUM, { Ox Gall 2 grs.; Pow'd Jamaica Ginger 1 gr }	Two to four pills,	38	1 70
RRI [Quevenne's] 1 gr	Two to six pills,	38	1 70
" 2 grs	One to three pills,	58	2 70
Carb., (Vallet's) U. S. P., 3 gr	Three to five pills,	31	1 35
Citrat: 2 gr	Two to three pills,	38	1 70
Comp: U. S. P	Two to six pills,	31	1 35
Ferrocyanid: 3 gr	One to two pills,	38	1 70
gr	Two to four pills,	50	2 30
gr	One to two pills,	38	1 70
1 gr	Two to five pills,	31	1 35

SUGAR COATED PILLS, CONTINUED.

	DOSES.	bottles of 100 pills.	bottles 500 pil
FERRI et Quass: et Nuc: Vom:	Fer. per Hydrogen, 1½ gr.; Ext: Quassiæ, 1 gr.; " Nuc: Vom: ½ gr.; Pulv. Saponis, ½ gr. — One to three pills,	58	2
" et Quinia Cit:	1 gr — Three to six pills,	58	2
" " "	2 gr — One to three pills,	1 08	5
" " "	3 gr — One to two pills,	1 55	7
" et Strychniæ,	Strychniæ 1-60 gr.; Ferrum per Hydrogen (Quevenne's) 2 grs. — One to three pills,	58	2
" et Strychniæ Cit:	Strych: Cit: 1-50 gr.; Ferri Cit: 1 gr. — One to three pills,	58	2
GALBANI Comp: U. S. P.	Galbanum, 1½ grs.; Pulv: Myrrh, 1½ grs.; Assafœtida, 1½ grs. — Three to five pills,	38	1
GAMBOGIÆ Comp:	Pulv. Gamboge; Aloe Socot: Zingib: Jam; Saponis, — Three to five pills,	31	1
GENT: COMP:	Ext: Gent: ½ gr.; Aloe Socot: ½ gr.; Pulv: Rhei: 1½ gr.; Ol: Carui, 1–5 gr. — One to five pills,	38	1
GONORRHŒÆ	Pulv: Cubebæ, 2 grs.; Bals: Copaib: Solid, 1 gr.; Ferri Sulph: Exsic: ½ gr.; Terebinth: Venet: 1½ gr. — Two to five pills,	46	2
HEPATICA,	Pil: Hydrarg: 3 gr.; Ext: Coloc: Comp: 1 gr.; Ext: Hyoscyam; 1 gr. — One to two pills,	70	3
HOOPER, (Female Pills) 2½ gr.	Aloes Socot: Ferri Sulph: Exsic Ext: Hellebor: Pulv: Myrrh: " Saponis, " Canellæ, " Zingib: Jam: — One to three pills,	31	1
" " "	Plain, in boxes, per doz. 90		
" " "	" per lb. 4 75		
HYDRARGYRI, U.S.P. 3 gr	One to five pills,	31	1
" 5 grs	One to three pills,	38	1
" Comp:	Mass: Hydrarg: 1 gr.; Pulv. Opii, ½ gr.; " Ipecac, ½ gr. — One to two pills,	62	2
" Iod. et Opii, [Ricord's]	Hydg: Iodid: 1 gr.; Pulv: Opii, ½ gr. — One to two pills,	58	2
IODOFORM et Ferri	Ferrum per Hydrogen, 1 gr.; Iodoform, 1 gr. — One to three pills,	2 70	13
IPECAC et Colocynth	Pulv. Ipecac, ½ gr.; Ext: Coloc: Comp: 2½ gr — One to two pills,	55	2
IPECAC: et Opii, 3½ gr.	[Pulv: Doveri, U.S.P.] — One to four pills,	38	1
LEPTAND: Comp:	Leptandrin, 1 gr.; Irisin, ½ gr.; Podophyllin, ½ gr. — One to two pills,	78	3
LUPULIN. 3 grs	Two to four pills,	31	1
MAGNESIA et Rhei	[1 gr. of each] — Five to ten pills,	31	1
MERCURY, Protiodid, 1 gr	One to two pills,	60	2
MORPHIÆ Comp:	Morph: Sulph: ½ gr.; Ant: et Pot: Tart: ½ gr; Calomel, ½ gr. — One pill,	1 15	5
OPII, U.S.P. 1 gr	One to two pills,	62	2
OPII et Camphoræ:	Pulv: Opii, 1 gr.; Camphoræ, 2 gr. — One to two pills,	70	3
OPII et Camphoræ et Tannin	Pulv: Opii, ½ gr.; Camphora, 1 gr.; Acid Tannic, 2 gr. — One to three pills,	70	3
OPII et Plumbi Acet:	Pulv. Opii, ½ gr.; Plumbi Acet: 1½ gr. — One or two pills,	62	2
PODOPHYLLIN et Hydrarg	Podophyllin, ½ gr.; Pil: Hydrarg: 2 gr. — One or two pills,	38	
POTASS: Bromid: 1 gr	Three to ten pills,	5	
" Iodid: 2 grs	One to five pills.	6	

SUGAR COATED PILLS AND GRANULES, CONTINUED.

	DOSES.	bottles of 100 pills.	bottles of 500 pills.
QUINLÆ Comp: Quin: Sulph: 1 gr.; Ferr: pr Hydrog: [Quevenne's] 1 gr.; Acid Arsenious, 1-60 gr.	One to three pills,	1 35	6 50
QUINIÆ et Ext: Belladon: Quiniæ Sulph: 1 gr.; Ext: Belladon: ½ gr.	Two to four pills,	1 35	6 50
QUINIÆ et Ferri: Quin: Sulph: 1 gr.; Ferr: per Hydrog: [Quevenne's] 1 gr.	Two to six pills,	1 35	6 50
QUINIÆ et Ferri et Strychniæ: Quin: Sulph: 1 gr.; Ferri Carb: [Vallet's] 2 gr.; Strych: Sulph: 1-60 gr.	One to four pills,	1 35	6 50
QUINLÆ et Ferri Valer: 2 grs.	One to two pills,	2 70	13 10
QUINIA et Strychnia Comp: Quinia Sulph: 1 gr.; Ferrum per Hydrogen, 1½ gr.; Strychnia, 1-20 gr.; Arsenious Acid, 1-20 gr.	One to two pills,	1 50	7 15
RHEI, U.S.P. Pulv: Rhei, 3 grs.; " Saponis, 1 gr.	Two to four pills,	58	2 70
RHEI Comp: U.S.P. Pulv Rhei: 1 gr.; " Aloes Socot: 1½ gr.; " Myrrh: 1 gr.; Ol: Menth: Pip:	Two to four pills,	58	2 70
RHEI et Ferri: Ext: Rhei: 3 gr.; Ferri Sulph: Exsic: 1 gr.	Two to three pills,	58	2 70
RHEUMATIC: Ext: Coloc: C. 1½ grs.; " Colchici Acet: 1 gr.; " Hyosciam: ½ gr.; Hydg: Chlor: Mit: ½ gr.	One to two pills,	70	3 25
SANTONIN, 1 gr.	One to two pills,	78	3 60
SCILLÆ COMP: U.S.P. Pulv: Scillæ, ½ gr.; " Zinzib: Jamaica, 1 gr.; Gum: Ammoniac: 1 gr.; Pulv: Saponis, 1½ gr.	Two to four pills,	38	1 70
STOMACHICÆ (Lady Webster's Dinner Pills, 3 grs. Pulv: Aloes: Socot: Gum Mastich: Flor: Rosæ,	One to two pills,	38	1 70
ZINCI VALERIAN, 1 gr.	One to three pills,	78	3 60

GRANULES.

ACID, Arsenious, 1-20 gr.	One to three granules,	31	1 35
" " 1-50 gr.	One to six granules,	31	1 35
ACONITIA, 1-60 gr.	One granule,	58	2 70
ATROPIA, 1-60 gr.	One to four granules,	58	2 70
CORROSIVE SUBLIMATE, 1-12 gr.	One to three granules,	31	1 35
" " 1-20 gr.	One to five granules,	31	1 35
DIGITALIN, 1-60 gr.	One to four granules,	58	2 70
ELATERIUM, [Clutterbuck's] 1-10 gr.	One to two granules,	78	3 60
EXTRACT BELLADONNA, ¼ gr.	One to four granules,	31	1 35
" CANNABIS INDICA, ¼ gr.	Two to eight granules,	46	2 15
" HYOSCIAMUS, ¼ gr.	Two to four granules,	31	1 35
" IGNATIA AMARA, ¼ gr.	Two to four granules,	40	1 80
" NUX VOMICA, ¼ gr.	One to four granules,	31	1 35
LEPTANDRIN, 1 gr.	One to two granules,	58	2 70
" ½ gr.	One to four granules,	38	1 70
" ¼ gr.	One to six granules,	31	1 35
" ⅛ gr.	One to eight granules,	31	1 35
MERCURY, PROTIODIDE, ¼ gr.	One to two granules,	31	1 35
" BINIODIDE 1-16 gr.	One to four granules,	31	1 35
MORPHIA ACET: ¼ gr.	One to two granules,	58	2 70
" Sulphate, 1-10 gr.	One to two granules,	46	2 15
" " 1-8 gr.	One to two granules,	58	2 70
" " 1-6 gr.	One granule,	66	3 10
" " ⅓ gr.	One granule,	85	4 00
" Valerianate, ¼ gr.	One to two granules,	78	3 60
PODOPHYLLIN, 1-10 gr.	One to four granules,	31	1 35
" ¼ gr.	One to two granules,	31	1 35
" ½ gr.	One granule,	38	1 70
" et Jalapin: Podophyllin, 1-9 gr.; Jalapin, 1-9 gr.; Pulv: Capsicum, 1-27 gr.	One to three granules,	38	1 70
POTASS: PERMANGAN: Cryst: ½ gr.	One to six granules,	38	1 70
QUINIA VALERIANATE, ¼ gr.	One to three granules,	1 55	7 40
SILVER NITRATE, ¼ gr.	One to two granules,	58	2 70
STRYCHNIA, 1-20 gr.	One to two granules,	31	1 35
" 1-40 gr.	One to four granules,	31	1 35
" 1-60 gr.	One to five granules,	31	1 35

CHEMICALS.

ACID, Acet. Glacial, 1 lb. g. s. b. 19c. lb. 1 80
" " No. 8, 5 lb. c. b. 22c. " 30
" Benzoic, English, c. v. 6c. oz. 60
" " German, c. v. 6c. " 38
" Boracic, 1 lb. c. b. 12c. lb. 90
" Butyric, g. s. b. 19c. " 4 00
" Chromic, 1 oz. g. s. v. 8c. oz. 60
" Formic, " " 8c. " 55
" Gallic, " c. v. 6c. " 38
" Hydrocyanic, 1 oz. g. s. v. 8c, " 15
" " " and tins, 15c " 15
" Lactic, concentrated, 1 oz. g. s. v. 8c. " 1 40
" " dilute, " " " 35
" Muriatic, carboys, lb.
" " Chem. Pure, 1 lb. g. s. bot. 20, " 45
" Nitric, 38°, ½ gal. g. s. bot. 35 " 18
" Oxalic, " 50
" Phosph. Glacial, 1 lb. c. b. 12c. " 3 25
" " Solution, " 10c. " 75
" Pyrogallic, 1 oz. & ½ oz. c. v. 6c. oz. 1 30
" Succinic, 1 oz. c. v. 4c. " 90
" Sulphuric, carboys, lb.
" " Aromat. 1 lb. c. b. 12 " 90
" " "Chem. pure, 1 lb. g. s. b. 18 " 65
" Tartaric. pulv. " 90
" Valerianic, 1 oz. g. s. v. 8c. oz. 1 50
ACONITIA, 1-8 oz. vials, 3c. 1-8 oz. 5 50
ALUM, in barrels. lb.
" Ammon. & Iron, 1 lb. c. b. 12c. " 1 75
" " " 1 oz. c. v. 4c. oz. 16
" Burnt, lb. 55
ALUMINA, Sulphate, cryst. " 1 50
AMMONIA, Arseniate, 1 oz. c. v. 4c. oz. 50
" Aqua F.F.F. Carboys, lb.
" " " " " 16
" " Concent. " 30
" Hypophosphite, g. s. v. 8, oz. 40
" Nitrate, cryst. 1 lb. c. b. 14c lb. 70
" " fused, " " " 70
" Oxalate, " " " 2 50
" Phosphate, " " " 2 00
" Spirit, " 11c. " 90
" " Aromat. " " " 1 00
" Valerianate, crystal, 1 oz. g. s. v. oz. 1 50
AMMONIUM, Bromide, 1 oz. c. v. 4 " 55
" Hydrosulphuret, 1 lb. g. s. b. 22 lb 80
" Iodide, 1 oz. c. v. 4, oz. 75
AMYLE, Valerianate of Oxide, 1 oz. g. s. v. 8 " 1 00
" Acetate of Oxide, 1 lb. g. s. v. 22 lb. 4 50
ANTIMONY, Chlorid. Cryst. ¾ lb. g. s. bot. 12 " 3 75
" " Solut. 1 lb " 19 " 40
" Sulphurated, 1 lb. c. b. 17 " 85
"and Potassa Tart. powd, 1 lb. c. b. 10 " 1 25
ARSENIC, Iodide, 1 oz. g. s. v. 8c. oz. 90
" Solution, Donovan's, 1 lb. c. b. 11c. lb. 38
" " Fowler's, 1 lb. c. b. 11c. " 20
" Sulphuret, Red, " 1 00
ATROPIA, 1-8 oz. 4 25
" Sulphate, " 4 25
BARIUM, Chloride, 1 lb. c. b. 9c. lb. 80
" Iodide, 1 oz. g. s. v. 8c. oz. 1 75
" Sulphuret, 1 oz. c. v. 4c. " 30
BARYTA, Pure, " " 4c. " 35
" Acetate, " " 4c. " 35
" Carbonate, 1 lb. c. b. 12c. lb. 1 50
" Nitrate, " " 9c. " 45
BISMUTH, Citrate, 1 oz. c. v. 4c. oz. 65
" & Ammon. Cit., Solut. 1 lb c. b. 12 lb. 1 25
" Subcarbonate, 1 lb. c. b. 14 " 7 50
" Subnitrate, " " 10 " 7 00
" Tannate, 1 oz. c. v. 4, oz. 1 40
" Valerianate, 1-8 oz. vials, 4c. " 2 50

CADMIUM, Bromide, 1 oz. g. s. v. 8c. oz. 60
" Carbonate, 1 oz. c. v. 4c. " 55
" Chloride, " " " 80
" Iodide, " " " 75
" Oxide, " " " 80
" Sulphate " " " 60
" Sulphuret " " " 60
CALCIUM, Bromide, 1 oz. g. s. v., 8c. " 1 00
" Chloride, fsd. 1 lb. c. b. 12c. lb. 90
CALOMEL, 1 lb. c. b. 6c. " 1 10
CARBON, Bisulphuret, 1 lb. g. s. b., 20c. " 45
CERIUM, Oxalate, c. v. 4c. oz. 1 40
CHINOIDINE, 1 oz. rolls, " 25
CHLOROFORM, 1 lb. g. s. b., 16c. lb. 2 25
CINCHONIA, 1 oz. c. b. 6c. oz. 60
" Sulph. " 6c. " 60
CHROMIUM, Oxide, pure, 1 oz. c. v. 4c. " 20
COBALT, Nitrate, 1 oz. g. s. v., 8c. " 1 40
" Oxalate, " c. v. 4c. " 1 40
" Oxide, " " 4c. " 1 10
COLLODION, 1 lb. c. b. 12c. lb. 2 40
" 1 oz. g. s. v. 8c. oz. } 18
" 1 oz. c. v. 4c. " }
" Canthar, 1 lb. c. b. 12c. lb. 5 75
" " 1 oz. g. s. v. 8c. oz. 38
COPPER, Ammoniated, 1 lb. c. b. 12c. lb. 1 80
" Arseniate, 1 oz. c. v. 4c. oz. 55
" Arsenite, " " 4c. " 40
" Carbonate, 1 lb. c. b. 12c. lb. 2 25
" Chloride, 1 oz. c. v. 4c. oz. 30
" Cyanide, 1 oz. c. v. 4c. " 40
" Ferrocyanide, " " " 45
" Nitrate, 1 lb. c. b., 11c. lb. 85
" Oxalate, " " 12c. " 2 00
" Oxide, black, 1 lb. c. b. 11c. " 2 50
" " 1 oz. c. v. 4c. oz. 18
COPPERAS, lb.
CORROSIVE SUBLIMATE, " 1 25
CREASOTE, 1 oz. g. s. v., 8c. oz. 15
" 1 lb. g. s. b., 23c. lb. 1 60
EMETINE, ½ oz. vials, 4c. oz. 4 00
EPSOM SALTS, lb. 8
" " in bbls. "
ETHER, Acetic, 1 lb. c. b., 12c. " 1 50
" Butyric, " " 12c. " 6 00
" Chloric, " " 12c. " 1 30
" Spirits Nitrous, carboys, $3 00, " 85
" Sulphuric, 1 lb. c. b., 12c. " 1 40
" " Washed, 1 lb. c. b., 12c. " 1 50
" " Concent. " 1 60
FUSEL OIL, 1 lb. c. b., 12c. " 50
GLASS OF BORAX, 1 lb. c. b., 12c. " 1 40
GLYCERINE, 1 lb. c. b., 10c. " 90
" Concent., 1 lb. c. b., 10c. " 65
" Pure, Bowers, " 1 10
GRANVILLE'S LOTION, " 12c. " 90
HOFFMAN'S ANODYNE, " 12c. " 90
IRON, Ammoniated, 1 lb. c. b. 12c. " 45
" Ammonio-Citrate, " " 12c. " 1 65
" " " 1 oz. c. v. 4c. oz. 12
" " Tartrate, 1 lb. c. b. 12c. lb. 1 65
" " " 1 oz. c. v. 4c. oz. 12
" and Magnesia Cit. " " " 18
" " Pot. Tart. powd. c. b. 12c. lb. 1 00
" " " flakes, " 1 65
" " " 1 oz. c. v. 4c. oz. 12
" " Quinia Cit. " " " " 85
" " Strychnia Cit. " " " " 95
" Arseniate, 1 oz. c. v. 4c. " "
" Bromide, 1 oz. g. s. v. 8c. " "
" By-Hydrogen, 1 lb. c. b. 10c. lb.
" Carb. Precip. " " 12c. "

CHEMICALS [CONTINUED.]

IRON, Ferrocyanuret 1 lb. c.b. 12c. lb. 1 80
" Hypophosphite, 1 oz. c. v. 4c. . oz. 65
" Iodide, 1 oz. g. s. v. 8c. . . " 60
" " Syrup, 1 lb. g. s. b. 15c. . lb. 95
" Lactate, 1 oz. c. v. 4c. . . oz. 25
" Muriate Tinct. 1 lb. c. b. 11c. . lb. 70
" Pernit. Sol. 1 lb. g. s. b. 19c. . " 45
" Persulph. Monsel's, 1 lb. c. b. 19c. " 1 80
" " " 1 oz. c. v. 4c. oz. 13
" " " Sol. 1 lb. g. s. b. 19c lb. 65
" Phosphate, 1 lb. c. b. 14c. . " 85
" Proto-Carb. (Vallet's) ½lb. j. 5c. . " 50
" Proto-Nit. Syrup, 1 lb. c. b. 11c. " 1 00
" Proto-Sulphate, " " 11c. . " 12
" " dried " " 11c. " 25
" Pyrophosphate, Sol. " 14c. . " 1 80
" " " 1 oz. c. v. 4c. oz. 13
" " Syr. 1 lb. c. b. 10c. lb. 75
" Sesquichloride, 1 oz. g. s. v. 8c. oz. 14
" Sesquinitrate, Syrup, 1 lb. c. b. 10c. lb. 1 00
" Sulphuret, " " 10c. " 35
" Super-Phosph. Syr. 1 lb. c. b. 10c. " 1 00
" Tannate, 1 oz. c. v. 4c. . . oz. 45
" Valer., 1 oz. v. 6c. ½ and 1-8 oz. 4c. " 1 50
IODINE, Resublimed, . . . " 55
KERMES, Mineral, . . . lb. 1 50
LACTUCARIUM, 1 oz. c. v. 4c. . oz. 55
LEAD, Chloride, 1 oz. c. v. 4c. . " 30
" Iodide, " " . . " 65
" Nitrate. . . . lb. 35
" Subacet. [Gou. Ex.] 1 lb. c. b. 11c. " 35
" Tannate, 1 oz. c. v. 4c. . oz. 45
LIME, Carbonate Precip. 1 lb. c. b. 18c. lb. 30
" Hypophosphite, 1 oz. c. v. 5c. . oz. 38
" Phosphate Precip. 1 lb. c. b. 18c. lb. 45
" Sulphite, . . . " 35
LUNAR CAUSTIC, Pure, 1 oz. c. v. 4c. oz. 1 45
MAGNESIA, Citrate, Soluble, 1 lb. c. b. 12 lb. 2 00
" " " 4 oz. bot. doz.
" Nitrate, 1 oz. c. v. 4c. . oz. 25
MANGANESE, Borate, 1 lb. c. b. 16c. . lb. 2 00
" Carbonate, 1 oz. c. v. 4c. oz. 35
" Chloride, " " . " 45
" Citrate, " " " 60
" Ferrocyan. " " . " 60
" Hypophosphite, " " 1 00
" Iodide, 1 oz. g. s. v. 8c. " 1 25
" Syr. 1 lb. c. b. 10c lb. 2 75
" with Iron Syr. 1 lb. c. b. 10 " 2 75
" Phosphate, 1 oz. c. v. 6c. oz. 60
" Sulphate, 1 lb. c. b. 11c. lb. 3 50
" 1 oz. c. v. 4c. oz. 35
" Tartrate, " " . " 60
" Valerian. 1 oz. g. s. v. 8c. " 2 25
MERCURY, Iodide, proto, 1 oz. c. v. 4c. " 60
" " deuto, " " " 60
" with Magnesia, [Hyd. C. Mag.,] lb. 1 40
" Oxide, black, 1 oz. c. v. . oz. 35
" Pernitrate, Sol., 1 lb. c. b. 10c. lb. 1 75
" Protonit. 1 oz. c. v. 4c. . oz. 45
" Sulph. blk. 1 lb. c. b. 10c. lb. 1 10
MERC. OINT. ½ Merc, 1 lb. cov. jar 14c. " 85
" ¼ " " " " " 70
MORPHIA ACET. ½ oz. v. and box, 30c. oz.
" SULPH. " " " "
NICKEL, Carbonate, 1 oz. c. v. 4c, . " 35
" Chloride, " " . " 35
" Nitrate, " " . " 35
" Oxalate, " " . " 35
Oxide, " " . " 35
Sulphate, " " . " 35

PIPERINE, 1 oz. c. v. 4c. . . oz. 2 50
POTASSA, Acetate, 1 lb. c. b. 17c. lb. 1 25
" Bicarbonate, " 11c. " 45
" Carb. [Sal. Tartar] " " " 22
" Caustic White, " " " 1 10
" com. " " " 60
" Chlorate, " " " 65
" Citrate, " " " 1 20
" Hypophosphite, 1 oz. c. v. 4c. oz. 40
" Liquor, 1 lb. g. s. b. 19c. . lb. 22
" Perman. com. 1 lb. c. b. 13c. " 1 00
" pure, 1 oz. c. v. 4c. oz. 60
" Tartrate, 1 lb. c. b. 11c. . lb. 1 20
POTASSIUM, Chloride, 1 lb. c. b. 11c. " 1 00
" Bromide, 1 lb. c. b. 10c. . " 5 00
" 1 oz. c. v. 4c. . oz. 40
" Cyan. fused, 1 lb. c. b. 12c. lb. 1 80
" Iodide, " " " " 5 50
" Sulphuret, " " . " 35
PYROXYLIN, [Collod. Cotton] 1 oz. c. v. 8c. oz. 75
QUINIA & Iron Citrate, 1 oz. c. v. 4c. " 85
" Tannate " " . " 4 50
" Sulphate " 5c. " 2 40
RED PRECIPITATE, . . . lb. 1 50
ROCHELLE SALT, Powdered, . " 60
SALICINE, 1 oz. c. v. 6c. . oz. 80
SAL PRUNELLE, 1 lb. c. b. 11c. . lb. 55
SANTONINE, 1 oz. c. v. 5c. . . oz. 1 40
SEIDLITZ MIXTURE, . . lb. 50
SILVER, Bromide, 1 oz. c. v. 4c. . oz. 3 00
" Chloride, " " . " 1 90
" Cyanide, " " . " 2 80
" Iodide, " " . . " 2 80
" Nit. Cryst. " " . " 1 45
" Oxide, " " . " 2 40
SODA, Acetate, 1 lb. c. b. 11c. . . lb. 1 00
" and Ammon. Phosph. 1 lb. c. b. 11c. " 1 75
" Arseniate, 1 oz. c. v. 4c. . . oz. 30
" Chlorate, " " . . " 18
" Chloride, Solution, . . gal. 50
" g. s. b. 18c. . . doz. 90
" cork bot. 12c. . . " 90
" Hypophosphite, 1 oz. c. v. 4c. . oz. 40
" Hyposulph. 1 lb. c. b. 11c. . lb. 15
" Phosphate, 1 lb. c. b. 12c. . " 35
" Pyrophosphate, 1 lb. c. b. 11c. . " 1 50
" 1 oz. c. v. 4c. . oz. 12
" Sulphite, crystals, c. b. 12c. . lb. 40
SODIUM, Bromide, c. v. 4c. . . oz. 75
" Iodide, " . . " 60
STARCH, Iodide, 1 oz. g. s. v., 8c. . . " 25
STRYCHNIA, ¼ oz. v. 30c. per oz. . " 4 50
SULPHUR, Iodide, 1 oz. g. s. v. 8c . " 60
" Precipitated, . . lb. 40
TANNIN, 1 lb. c. b. 40c. . . " 5 00
" 1 oz. bottles, 8c . . oz. 35
VERATRIA, ¼ oz. v. 30c per oz. . " 5 50
WHITE PRECIPITATE, . . lb. 1 80
ZINC, Acetate, 1 lb. c. b. 12c. . " 1 40
" Carb. Precip. " " . . " 45
" Chloride, 1 oz, g. s. v. 8c . oz. 14
" " solu. 1 lb g. s. b. 18c . lb. 30
" Cyanuret, 1 oz c. v. 4c. . oz. 30
" Ferrocyanuret, " " . . " 30
" Iodide, 1 oz g. s. v. 8c . . " 65
" Oxide, [true] c. b. 13c . . lb. 45
" Phosphate, 1 oz c. v. 6c . . oz. 20
" Sulphate, 1 lb c. b. 12c . . lb. 12
" Valerian, 1 oz v. 6, ½ and ¼ oz v. 4c oz. 1 40

Pure Powdered Drugs and Spices.

ACACIA, White	lb.	1	20
" Med	"		90
" Natural,	"		80
ALOES, SOC	"	1	55
" BONAIRE,	"		90
" CAPE,	"		56
" ET CANELLA	"	1	10
ALTHEA, RAD	"		56
ALUM	"		15
AMMON: MUR	"		45
AMMONIAC	"		85
ANISEED	"		68
ACONITE ROOT	"		80
" FOL	"		70
ARNICA FLOR	"		75
AROMATIC, U. S. P	"	2	25
ASSAFŒTIDA, PURE	"		90
AURANTII CORT	"		56
BAYBERRY	"		28
BELLADONNA	"		75
BLUE MASS	"	1	30
BONESET, HERB	"		56
BUCHU FOL	"		85
CALAMUS	"		56
CANELLA ALBA	"		40
CANTHARIDES	"	2	50
CARBO LIGNI WILLOW	"		25
" " POPLAR	"		20
" " COM	"		12
CARDAMOM	"	5	50
CARAWAY	"		50
CASCARILLA	"		56
CASTILLONS	"	1	70
CATECHU	"		56
CHENOPODIUM AMERICAN	"		50
CINCHONA CALISAYA	"	2	25
" RUBRA	"	2	50
CIMICIFUGA	"		40
COCCULUS INDICUS	"		80
COLCHICI RAD	"		50
" SEM	"		75
COLOCYNTH, [Pure Pulp]	"	3	25
" [Pulp and Seed]	"	1	10
COLOMBO	"	1	00
COMPOSITION, ½ lb papers	"		70
CONII FOL	"		65
CORIANDRUM	"		45
CUBEBA	"		75
CURCUMA	"		40
CUPRI, ACET	"		90
" SULPH	"		50
DIGITALIS	"		60
DULCAMARA	"		50
ERGOTA	"	2	50
FENNEL	"		50
FŒNUGREEK	"		25
FERRI SULPH. EXSIC	"		20
GALLÆ	"		90
GAMBOGE	"	3	25
GENTIAN	"		31
GLYCYRRHIZA RAD	"		40
GOLDEN SEAL	"		65
HELLEBORE NIG	"		56
" AMERICAN	"		80
HYOSCIAMUS FOL	"		70
INULA [Elecampane]	"		50
IPECACUANHA	"	5	50
" et Opii	"	2	50
IRIS FLORENT	"		35
JALAP ROOT	"	3	00
JUNIPER BACCA	"		22

LADY SLIPPER	lb.		
LEPTANDRA [Black Root]	"		55
LINUM [Flaxseed]	"		11
LIQUORICE, Calabria	"		75
" Sicily	"		55
LOBELIA, Herb	"		80
" Seed	"	1	40
LUPULINE	"	1	70
MYRRH, [Turkey]	"	1	10
NUX VOMICA	"		56
OPIUM (Pure Turkey) variable.			
OSS. SEPIA	"		56
PODOPHYLLI	"		35
POPLAR BARK	"		35
POTASSA NIT [pure]	"		40
" SULPH	"		22
PRICKLY ASH BARK	"		60
QUERCUS ALBA	"		25
" NIG	"		15
RHEI	"	5	00
ROSÆ [Red]	"		
SABINA	"		45
SALEP	"	2	00
SANGUINARIA	"		35
SASSAFRAS, Rad. Cort	"		45
SAPO, CASTILE	"		70
SERPENTARIA	"	2	80
SCILLÆ	"		50
SEM. CYNÆ, [Lev. Wormseed]	"		70
SENNA ALEX	"		56
SENEGA	"	1	00
SODA BORAS	"		60
SPIGELIA	"	1	00
STRAMONII FOL	"		60
TRAGACANTH, White	"	1	75
" Sorts	"		90
ULMUS [Slip Elm] Fine	"		50
" " Coarse	"		45
UVA URSI	"		45
VALERIAN, English	"	1	00
" German	"		56
WILD CHERRY BARK	"		40
ZINGIBER	"		65

Ground Drugs.

BRUISED SARSAPARILLA, Mex	lb		55
" " Hon	"		70
GROUND BAYBERRY	"		25
" FLAXSEED	"		11
" FŒNUGREEK	"		18
" GALLS	"		85
" GENTIAN	"		22
" HEMLOCK BARK	"		28
" NUX VOMICA	"		45
" ORANGE PEEL [Bitter]	"		40
" POPLAR BARK	"		28
" WILD CHERRY BARK	"		25

Ground Spices.

Strictly Pure.

GROUND ALLSPICE	lb		45
" CAPSICUM, African	"		65
" CASSIA	"		85
" CLOVES	"		60
" GINGER, African	"		40
" " Race	"		35
" MUSTARD, Brown			
" " Yellow			

Concentrated Remedies.

In 1 oz. vials.

ALNUINE	per oz.	
AMPELOPSINE	"	
APOCYNIN	"	
ASCLEPIDIN	"	
BAPTISIN	"	
BAROSMIN	"	
CAULOPHYLLINE	"	
CERASINE	"	
CHIMAPHILLIN	"	
CIMICIFUGIN	"	1 10
COLOCYNTHIN,	"	4 50
CORNINE	"	1 25
CYPRIPEDINE	"	2 25
DIGITALINE	"	
DIOSCOREIN	"	
ERGOTINE	"	1 40
EUONYMINE	"	
EUPATORINE	"	
EUPURPURIN	"	1 75
GELSEMININE	"	
GERANINE	"	1 00
GILLENINE	"	
HELIANTHEMIN	"	
HELONIN	"	
HUMULIN	"	
HYDRASTINE	"	2 00
HYDRASTIA, MURIATE	"	
HYOSCYAMINE	"	
IRISIN	"	1 40
JALAPIN	"	5 50
JUGLANDIN	"	1 10
LEPTANDRIN	"	1 00
LUPULIN	"	1 40
LOBELINE	"	
MENISPERMIN	"	
MYRICIN	"	1 00
PANDURATIN	"	
PHYTOLACCIN	"	
PODOPHYLLIN	"	1 00
POPULIN	"	
PRUNINE	"	
PTELEIN	"	
RHUSIN	"	
RUMICIN	"	
SANGUINARINE	"	1 20
SANGUINARINA	"	
SCUTELLARINE	"	
SENECIN	"	1 65
SENECIONINE	"	1 65
STILLINGINE	"	
VERATRIN	"	
XANTHOXYLIN	"	

CERATES.

CANTHARID., U.S.P.	lb.	1 40
CETACEI,	"	1 10
PLUMBI SUBACETAT.	"	1 10
RESINA,	"	70
" Comp.	"	75
SABINA,	"	75
SAPONIS,	"	85
SIMPLEX,	"	85
ZINCI CARB.	"	85

CONFECTIONS.

AROMAT.	lb.	1 55
OPII. U.S.P.	"	2 00
PIPER NIG.	"	85
ROSÆ,	"	56
SENNA,		56

FRUIT ESSENCES.

1 lb. CORK BOTTLES, 12c

APPLE,	lb.	3 25
BANANA,	"	3 25
JARGONELLE PEAR,	"	3 25
LEMON,	"	3 25
MULBERRY,	"	3 25
ORANGE,	"	3 25
PEACH,	"	3 25
PINE APPLE,	"	3 25
RASPBERRY,	"	3 25
STRAWBERRY,	"	3 25
VANILLA,	"	3 25

SYRUPS.

GLYCEROLE HYPOPHOSPHITES,	lb.	1 25
HYPOPHOSPHITES, Comp.	"	85
IPECAC,	"	90
PHOSPHATES, Comp.	"	56
POPPIES,	"	1 00
RHEI AROMAT., U.S.P.	"	65
" ET POTASSA, Comp.	"	75
SARSAP. Comp.	gal	4 10
SCILLÆ,	lb.	35
" Comp.	"	56
SENEGA,	"	68
STILLINGIA, Comp.	"	70

MISCELLANEOUS.

ACETUM OPII. [Black Drop]	lb.	6 00
AQUA DESTILLATA,	gal.	18
" ROSA DEST.	"	1 10
COPAIBA, SOLID,	lb.	1 60
DR. SOL. BROWN'S LIQ. HAIR DYE,	doz.	4 50
ELIXIR CINCHONA,	lb.	85
" " FERRATA,	"	85
" CALISAYA, IRON & BISMUTH	"	1 00
" PYROPHOSPHATE IRON,	"	90
" VAL. OF AMMONIA,	"	1 40
PREPARED OX GALL,	"	1 75
TINCT. CINCHONA FERRAT,	"	1 20
" VERAT. VIRIDE,	"	1 10
UNG. HYDRARG. NIT] Cit. Oint.	"	60
" " OXID. RUB.	"	80
" PICIS LIQ	"	56
" STRAMONIUM.	"	50
VIN COLCHICI RAD.	"	1 40
" " SEMEN,	"	1 40
" ERGOTA,	"	1 40
" IPECAC.	"	1 70
WISTAR'S LOZENGES,	"	1 20
" "	gro.	11 00

All our preparations are guaranteed to be of prime quality, and full strength, and warranted to give entire satisfaction, being manufactured in every instance under our own supervision.